COMPUTERWORLD

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NEWSPAPER

Fingered!

Image digitizing techniques are the basis for a new fingerprint identification system developed by Calspan Corp. The photos above show a fingerprint, top, and the digitized image produced by the system for automatic analysis and identification. (See Story on Page 5.)

Claims Throughput Doubled

Burroughs Upgrades MCP, Logic of B7700

By Vic Farmer
Of the CW Staff

DETROIT – Burroughs has combined upgraded software and improved utilization of instruction logic to double the effective throughput of its large-scale 7700 Series.

By enhancing its data base management system (DMS) and modifying its Master Control Program (MCP), Burroughs has improved the system which is comparable to IBM's 370/158-168 range both in price and capabilities.

The new processor retains the same number designation (7701) as the older model but employs an enlarged Local Processor Memory (LPM) somewhat similar to the cache memory on IBM systems.

This increase provides 6K bytes of bipolar memory with an effective speed of 42 nsec/byte, instead of previous 100-byte local memory.

While the number of basic instructions remains the same, the logic behind some instructions was changed to take advantage of CPU circuitry improvements. The processor remains object code-compatible with older Burroughs equipment.

Burroughs claims this new processor will double previous effective CPU speeds.

Burroughs estimates that software enhancements contribute about one fifth of the increase in systems performance.

DMS was originally designed as an application program to operate outside of the systems software, but the new DMS II is incorporated as an extension of systems software, according to Burroughs. Burroughs claims DMS II is five to 10 times faster than the older DMS.

This design eliminates duplication of effort in functions which typically add overhead such as accessing files or initiating I/O operations.

Added features in the MCP include system balancing, which allows a user, at his option, to observe programs running in particular job environments. The user can then tune the system to his workload, according to Burroughs.

Changes can be incorporated dynamically and the user can observe the degree of improvement or degradation of system configuration changes without interrupting the active processing.

(Continued on Page 2)

Four Indicted in Explosion At Rival Service Bureau

By Edith Holmes
Of the CW Staff

SANTA ANA, Calif. – The president of Data Specs Computer Services, his wife and two employees have been indicted by a grand jury here in connection with an explosion and fire which destroyed the computer of a rival service bureau.

Peripheral equipment and some data files were also destroyed in the conflagration earlier this summer at Computeristics, Inc. [CW, July 10].

A computer operator for Data Specs, Jeff Smentek, has been charged with arson and burglary, according to Bill Tynes, an investigator for the district attorney here.

The firm's president, Kenneth G. Berry, and his wife Martha have been indicted as accessories to the crime and for conspiracy to obstruct justice, he said.

The head of the Data Specs computer operation has also been charged by the grand jury, but William Wright, arson investigator for the fire department, said the manager has not yet been apprehended.

(Continued on Page 4)

Nasis Chides States for Security Neglect

By Nancy French
Of the CW Staff

LEXINGTON, Ky. – The failure of state governments to provide security and privacy for information processing activities represents a "potential catastrophe of great magnitude," according to the National Association of State Information Systems (Nasis).

The warning was issued in its recently published fourth annual report based on a survey of information systems in state governments.

The security warning was included with data on everything from the size of the present state computer population to the status of consolidation in the 47 reporting states.

According to the survey, much remains to be done in the area of security and privacy. The audit, which Nasis called "the most crucial function" in assuring secure systems, was reported in use by only nine states in the area of physical security. Only six states audit data security.

Total physical security plans were reported "implemented" by 20 states, "enforced" by 17 and "audited" by nine.

Total data security plans were reported implemented by nine states, enforced by eight and audited by only six.

As for confidentiality and privacy, 24 states reported "increasing" public concern, while only two felt state statutes provided "sufficient" protection.

Statutes describing standards of confidentiality and privacy were reported as "nonexistent" by 16 states, and 11 failed to even answer the question.

Cost Conscious

At the same time, the Nasis document reported a near halt to the proliferation of state computers, but better use of existing computer resources as costs continue to rise.

States reported 41% of their DP budgets were spent on hardware in 1971, but only 33% went for hardware in 1973. Meanwhile, personnel costs increased from 51% to 53% of the total budget.

Costs for consultants went from 2% to 3% of the total budget, and "other" swallowed up the rest, increasing from 6% to 11% of the DP budget over the same two-year period.

Nasis attributed stabilizing hardware costs to consolidation of computer hardware, improvement in operations management and "greater bang for the buck" as users move to larger computers.

Increasing costs of all classes of DP personnel reflect general salary increases, according to Nasis. In addition, the report said as the number of applications increased, so did the number of personnel, while existing hardware often has been able to absorb the increased workload.

Transfers Increasing

Greater reliance on consultants, Nasis said, accounted for the 1% increase in consultant fees paid by states. In 1973, state governments put a new high of $9.6 million into consultants' pockets.

Despite increasing expenditures on personnel, states are beginning to document savings on systems design and programming by transferring software from state to state.

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75 Sessions Planned

15,000 Expected at Info '74

NEW YORK – A total of 75 sessions, plus three intensive one-day short courses, promise to keep the expected 15,000 attendees at Info '74 busy here this week.

The sessions, concentrated primarily in industry and application areas, will be coupled with a four-day exhibit program which has drawn 137 companies displaying their wares in 330 booths.

The major application areas covered by the sessions include manufacturing, retailing, banking, hospitals, insurance, government, service organizations, administrative services, financial, marketing and personnel.

In addition, there will be a full program devoted exclusively to DP management and technology, according to American Management Associations, sponsor of the four-day event.

The three full-day short courses will cover "You and Your Information System: A Minicourse in Getting the Information You Need for Your Decision Making" (to be given twice), "Fundamentals of Data Communications" and "A Minicourse in Using Microfilm to Store and Retrieve Records."

The sessions will be spread between Lincoln Center and the Americana Hotel here, while the exhibition will occupy the third and fourth floors of the New York Coliseum.

Sessions will generally start at 9 a.m. and occupy most of the day, while the exposition will be open from 11 a.m. to 5 p.m. Monday through Wednesday and 11 a.m. to 4 p.m. on Thursday.

Complete information on Info '74 sessions begins on Page 19.

CW Launches German Sister

MUNICH – A weekly newspaper written in German for computer users and manufacturers in Europe's largest computer market will be inaugurated next month by Computerworld GmbH, a subsidiary of Computerworld, Inc.

The new publication will be the only weekly computer newspaper in Germany, which ranked third in the world market with 11,000 computer systems worth more than $4 billion at the end of 1973.

Otmar Weber, general manager of Computerworld GmbH, said the first

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Faster Processor

Burroughs Upgrades MCP, Logic of B7700

(Continued from Page 1)

The diagnostic capabilities of the system are also improved so that field engineers will be able to more easily diagnose the system and implement repairs, Burroughs said.

Another feature in the upgraded MCP is what Burroughs calls a job continuation feature, which allows a program to continue to run from the instruction at which it was interrupted by mechanical or electrical failure. The system will attempt to restart at precisely the last instruction before the interruption occurred.

User Needs

As with the previous 7700 Series, I/O processors and memory modules may be combined in a variety of ways to suit the user's particular needs, Burroughs noted. Four major models based on the new processor will replace the four previous models in the 7700 series: B7718, B7728, B7738, and B7748.

The four new B7700 systems are the B7750, B7760, B7770 and B7780.

The B7750 basic model has one CPU and one I/O processor with 24 channels.

The B7760 basic model has two CPUs and two I/O processors, each with 24 channels.

The B7770 basic model has three CPUs and two I/O processors, each with 24 channels.

The B7780 basic model has four CPUs and two I/O processors, each with 24 channels.

Each basic system includes a maintenance diagnostic unit and two desk display operator consoles.

As processing requirements expand, additional central and I/O processors can be added on site to any of these models.

Each system can be expanded to include a maximum of eight processing units, which may include any combination of central or I/O processors, according to Burroughs.

Total main memory capacity of the B7700 models is 6M bytes of information. With a technique called memory phasing and interleaving, the B7700's main memory has an effective access time of 88.5 nsec/byte, the firm said.

The B7700 central processors, with a speed of 16M cycle/sec, incorporate a special bipolar integrated circuit local memory, which has a capacity of 6K bytes with an effective access time of 42 nsec/byte.

Vectors Standard

The central processors include vector operators as a standard feature. Vector operators are said to provide higher levels of performance in scientific and mathematical applications which involve complex array or matrix operations. They increase processor speed by utilizing high-speed integrated circuit registers for data address calculations, reducing processor accesses to main memory, the firm said.

The independent I/O processor is an integral part of the B7700's distributed processing architecture. This processor performs I/O functions independently of the arithmetic and logic operations of the central processor.

Each basic I/O processor can accommodate 20 peripheral units and four disk subsystems, which can work in parallel. Channels can be added to each I/O processor to handle four additional disk subsystems and four data communications processors. The four data communications processors can handle up to 1,024 lines and each line normally services multiple terminals.

The B7700 is programmed exclusively in high-level languages such as Cobol, Algol, Fortran, PL/I and Basic. In addition, the B7700 features an interactive APL capability.

A higher degree of reliability over the older 7700s is provided by the systems through such features as multiple data paths, error correcting memories, error detecting circuitry, residue checking, instruction retry and independent power supplies for each central system module, Burroughs said.

Prices for new B7700 systems range from $3.7 million for a system with minimum peripherals to $9.4 million for a maximum system. Comparable monthly lease prices range from $80,000 to $200,000, Burroughs said.

These prices are about the same as the models replaced, but the units' main claim is faster throughput, added the firm.

Farm Area Cancer Victims Aided

VISALIA, Calif. – A physician in this small farming community is using a computer to analyze the histories of cancer patients to help determine what treatment methods work best.

Dr. Donald McGrew, who heads the pathology lab at Keweah Delta District Hospital, has developed a system that now contains medical records on more than 1,700 local cancer patients.

The computer in use, an IBM System/3 Model 6, provides reports on individual patients and generalized statistical data.

For each patient, the file contains a listing of background information, diagnosis, treatment and current condition.

"One entry in the computer creates a patient master file for us with cumulative medical history and billing information," McGrew said.

"At the same time it lets us give the patients a quick medical report, to keep them from worrying, and saves participating doctors from having to answer 13,000 telephone requests for test results every year."

Summary reports, organized by subject, provide an overall picture, for example, of the number of patients who have been treated with surgery or those who have had skin cancer.

Reinforced Belief

Statistics, developed from the computerized data on area patients, have reinforced medical belief that one type of cancer frequently found here occurs more often in hot areas.

That type of cancer, according to McGrew, is the malignant melanoma, which develops from a mole, and in Tulare County where the town is located, summer temperatures often soar over 100 degrees.

McGrew also said the computer-generated data has shown treating cancer with drugs – or chemotherapy – has been far more effective in many cases than surgery or irradiation.

Since there are often conflicting ideas about the best means of treating a particular patient, every local case is reviewed by the Regional Tumor Board, composed of a group of doctors who meet weekly to recommend courses of treatment.

The patient's own physician, of course, is free to accept or reject the recommendations.

Tumor Board members then check on each patient annually, as required by the American College of Surgeons which has accredited the board, and that information too, goes into the computer.

McGrew also uses the computer to track the more than 13,000 Pap tests performed annually by his laboratory. The test, designed to detect cervical cancer in the early stages, has been credited with an almost 100% cure rate.

"If cancer is detected early enough, and treated properly, a patient can lead a productive life," McGrew said.

"The computer is helping us make sure our patients receive the best follow-up care we can provide."

Nasis Report Chides States for Security Neglect

(Continued from Page 1)

Nasis said "solid accomplishments can now be reported" in the area of transfer projects – a vast change from past annual reports where transferability was discussed "in the future tense."

While data is incomplete, 17 states reported transfer of systems development and programming in 1973.

Idaho, for example, reported saving $500,000 by adopting a drivers license system designed in Oregon.

A welfare system from Oklahoma provided a similar savings for Minnesota, Nasis noted.

Reporting on consolidation, which Nasis described in terms of "coordination and control," little change was noted from 1972 to 1973, with all states reporting some degree of central control over hardware acquisition.

Nearly all states reported central control over information systems planning. Varying degrees of control were reported by about two thirds of the states in the area of design, programming and operations.

Difficulties

Nasis asked states to rank order the external difficulties encountered in information systems development. In general, states said their most serious problems continue to concern relationships with management and user agencies.

States that experienced "increased" difficulties reported them in the area of "recruitment of qualified personnel and need for a common data base.

"Lack of a definitive plan" is an area that requires immediate and concentrated attention, Nasis reported, noting that category's movement from fifth place in 1971, to fourth in 1972, to second in 1973 as evidence of trouble.

While "resistance to consolidation" is still high on the list, its slip from second to fourth indicates it is becoming less of a problem.

Nasis cited as significant the fact that "inadequate financing" was reported both in 1972 and 1973 as the states' least serious problem.

The most serious internal problems reported in 1973 were "missed programming schedules" and "programming backlog."

"Cost overruns," ranking as the eighth most serious problem in 1972, ranked third in 1973.

State Plans

"The importance of a formalized state plan for information systems cannot be overestimated," the report affirmed.

Noting the increase in the number of states with such a plan, Nasis is still aiming for 100%.

In addition to summaries, charts and general commentary, the report contains appendices listing a wide variety of computerized applications with an offer to provide information on availability for states interested in transferring.

The report is available from the Council of State Governments, Iron Works Pike, 40505. The price is $10.00.

PHASE 1 OF SYSTEM LIFE: DESIGN

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According to the book, it is in the design phase that a system is documented and analyzed in detail — internal structure and all external operations and procedures. That each module is completely specified, ready to be parceled out to programmers. That the system is transformed from a concept in one or two people's minds to a detailed "public" entity.

But specifications and system charts are tedious and expensive for professional people to complete properly, and to continuously update. Good systems people might like to put all the necessary design specifications on paper in proper form, and give user communications the attention it needs . . . but — all too often — the pressure of more work prevents that from happening.

The ADR family of software products, the Talent Amplifiers, automate design documentation and its updating . . . and can help to evaluate that design. First you define the system components and their relationships to AUTOFLOW II. Then the AUTOFLOW II Automated System Charter (ASC) processor automatically generates system diagrams showing the external characteristics and operating requirements of the system. Special reports show the system specifications and the origins and dispositions of all the data in the system. Revisions are simple to enter, and you can automatically generate updated charts at any time.

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The Design Phase also is the time to plan for the impact on site resources of the new system. How will it operate under the new VS operating systems. How much CPU and core is required for CICS for a given set of applications and terminals. How much will TSO degrade batch jobs and the impact of TSO when increasing TSO jobs within a region.

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Canadians Warned to Approach EFTS With Caution

By T.M. Whiteman

Special to Computerworld

OTTAWA, Ont. – A move to wider use of electronic funds transfer systems (EFTS) among Canada's chartered banks should be tempered with a good degree of caution, according to C.N. Downing, deputy general manager, The Royal Bank of Canada.

In an assessment on the need for EFTS at the recent annual joint conference of the Data Processing Institute and the Canadian Information Processing Society here, he noted that although most Canadian chartered banks have the technical capability to transfer funds on magnetic tape or via data transmission, "there's relatively little incentive to take this step.

"As the bank customers want their checks returned, and the customer's bank branch must satisfy itself that the item is not fraudulent, the items must be sorted down to the customer level," he said.

"Further, the banks prefer to run an audit control on the received items in accordance with their own operating and control procedures.

"In many ways, the Canadian interbank clearing system is one of the most efficient in the world," Downing noted. "The major participants are represented coast-to-coast and they in turn act as agents for other participants with limited geographic representation.

"This allows for regional interchange and early return of items into the payer's bank network. The major problems of interbank coordination inherent in the U.S. banking system are absent," he said.

He noted that there is still considerable room for improvement, "but this improvement depends largely on steps taken by individual banks within their own clearing networks."

Test of Time

Downing said in spite of all that has been written and said about the shortcomings of the check as a payments or funds transfer method, "it has many advantages and has stood the test of time, and is also generally favored by both business and individuals.

"The customer is the final arbiter as to what he or she wants, and it is safe to assume that checks will only be replaced by other methods when the customer considers the paper document [unnecessary].

"The challenge, therefore, is to eliminate the checks where they are not needed and to improve the handling of checks where the customer requires that they be retained," he said.

Funds transfer between Canadian banks involves substantial volumes, estimated at 10 million individual transactions per day, the majority for relatively small amounts.

Downing noted that all the evidence indicates the present methods of funds transfer within the Canadian banking system work extremely well, in fact, too fast for those paying their bills. He said placing a constraint on the escalation of costs is the prime reason for moving toward EFTS.

"However, the methods and timing adopted must be in accord with the human factors involved and with the relative priorities vis-a-vis other desirable projects," he concluded.

4 Indicted in Bureau Explosion

(Continued from Page 1)

The Computeristics and Data Specs service bureaus compete to provide area companies with billing and bookkeeping services, Wright said.

While he and Tynes conceded investigators have a theory about the motive for the crime, neither would confirm a connection between service bureau competition and the fire.

Smentek allegedly broke into the Computeristics service bureau at about 5 a.m. on June 23 and poured gasoline over the IBM 360/40 and peripheral devices. Before he could set fire to the mainframe, the fumes from the gasoline exploded, destroying the equipment and damaging the building, Wright theorized.

Although the arsonist escaped, the investigator for the fire department said evidence indicated whoever broke into the center was injured by the explosion. He added that when Smentek was arrested he was suffering from burns over 12% of his body.

Following the destruction of the computer center, police traced the suspect to the Lake Tahoe area, where he sought medical assistance, allegedly with the aid of Martha Berry.

Three of those indicated were apprehended by the end of August: Smentek in Houston, Martha Berry in Hattiesburg, Miss., and Kenneth Berry as he was leaving Santa Ana for Jamaica, Wright noted.

Computeristics, a subsidiary of Uniroyal, put its service bureau back in operation within four days of the explosion by flying in a replacement 360/40 from its facility in Middlebury, Conn.

A spokesman for the company said another machine has since been leased from a third-party lessor and the service bureau is again operating from its orginal building.

The firm was still unable to estimate the cost of the damage to its center, but the spokesman contended reports of a $2 million loss were high.

A pretrial hearing for Smentek and the Berrys has been scheduled for Oct. 4, and the trial itself is tentatively set for Nov. 12.

The case could acquire added dimensions, a source close to the investigation said, should the insurance companies representing Computeristics and Data Specs file suit to determine who should cover the expense of damages to the center if the trial proves the incident was not an accident.

Dutch Wives Declare War

AMSTERDAM – Wage war against computers?

That's what Vilma Krekels, irate over erroneous bills generated by computers, has urged housewives here to do.

"You can confuse the computer by sending it a check for two cents more than it has demanded," she told women of the Monday Club.

She suggested an alternative strategy is to "give the machine a nervous breakdown by cutting out one of the coded numbers on the punch card with scissors or a razor blade."

Above all, Krekels cautioned club members, "never ignore computers.

"Just keep pampering them with silly replies and don't bother to point out their mistakes," she said.

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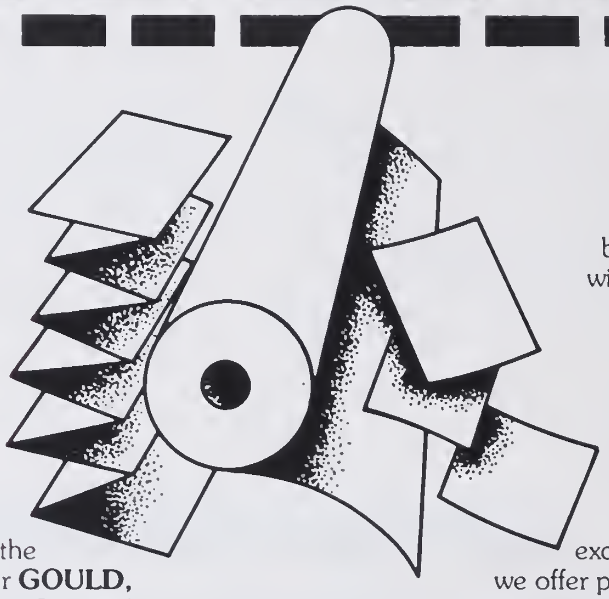

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Identification System Utilizes Digitized Fingerprint Images

By Nancy French
Of the CW Staff

BUFFALO, N.Y. – In addition to a coded identification number, users may soon have to give their terminals a finger in order to gain access to sensitive information.

A special-purpose minicomputer developed to verify fingerprints, Fingerscan can be used as positive identification and could be used to activate doorlatches, gates or keyboards in sensitive environments.

Designed by Calspan Corp., the unit is built around a central station consisting of a hard-wired, nonprogrammable minicomputer controlled by a Texas Instruments (TI) 980 minicomputer.

The system utilizes a single TI disk unit to store one fingerprint and identifying number for up to 9,000 individuals.

Since an individual may choose to file any fingerprint he wants (with the exception of the thumb), a person who for some reason has an unreadable print on one finger can still be identified by the system.

To activate the system, the individual keys in his identification number on a touchtone keyboard, much like that found on a telephone, and, when instructed, presses one finger against a template on the terminal.

Within two seconds, Fingerscan will read the fingerprint, compare the "minutiae" or tiny ridge endings and branches in the print with those on file and signal back either "access permitted" or "access denied."

Preprinted messages are displayed on a backlighted panel throughout the identification procedure to give the individual instructions in sequence and inform him when the process has been completed.

Under certain secure conditions, individuals can be added to or deleted from the file in the same two seconds.

The system is applicable at factory gates or at military posts. It can also be used within an organization to control entrance to restricted areas.

Calspan explained that some of the technology used in Fingerscan was developed by the company for the automatic fingerprint reader produced for the FBI.

Two models are available – the first for storage of up to 500 prints, the second for storage of up to 9,000 prints.

Basic price for the central station is $29,000, plus options, and terminals start at $2,900.

Calspan is at P.O. Box 235, 14221.

Computerworld Starts German Publication

(Continued from Page 1)

issue of *Computerwoche* will be mailed to 22,000 company officers, data processing managers and top technical personnel at user sites, manufacturing executives and service bureaus.

The initial issue, scheduled for Oct. 9, will also be distributed at the Interkomma Conference in Dusseldorf the following week.

Computerwoche will be the second foreign language affiliate of *Computerworld.* The first, *Shukan Computer,* was launched two years ago to serve Japan's computer community. *Shukan Computer* now has the widest circulation and the most advertising of any computer publication in the Far East, according to Patrick McGovern, president of *Computerworld.*

Market Ripe

The German market is expected to grow rapidly over the next four years. Recent market studies forecast a 25% per year growth in terminals and communications through 1977, a 32% annual increase in software and services revenue and a 30% per year growth in minicomputer sales.

Steady growth in overall user spending is expected to average 14% annually, making Germany one of the fastest growing of the world's major computer markets.

According to Weber, a recent readership study by IDC Deutschland indicated users are most interested in new products, new services and new application techniques. The weekly information service planned by *Computerwoche* will be aimed at these needs and serve as "the voice of the user" through interviews and case studies, Weber said.

Until now, Germany has been the only major world market without a weekly native language industry newspaper.

The Computerwoche staff will be headquartered at 8000 Munich 90, Tegernseer Landstrasse 300, West Germany (telephone: 089-690-7052). Subscriptions are DM 52 ($20) a year.

Privacy Top Concern of Americans

By Nancy French
Of the CW Staff

NEW YORK – Although inflation is clearly the hottest public issue at the moment, privacy ranks very high as a matter of concern to Americans, according to a recent Louis Harris poll.

The survey showed Americans are so bugged by credit bureau use of information (much of which is computerized) on private individuals that a 75% majority said they favor legislation to "spell out what kinds of personal information credit companies can collect and hold in their files."

Eighty-three percent of those surveyed agreed with the statement that "an individual should be given the opportunity to review and correct inaccurate information on his credit record."

Seventy-eight percent also agreed that legislation should make credit bureaus "notify an individual when an unfavorable report has been made about him and tell that individual the name of the agency making that report."

Seventy-six percent want a law which would "prohibit credit information from being given to noncreditors, such as the government, without the permission of the person involved."

The Harris survey also found that an overwhelming 74% of those polled thought privacy legislation should contain "procedures for removing information from an individual's credit file.

Surveyors said many people feel that once a bad credit rating has been entered, even if an individual becomes a good credit risk, there is no way to expunge the negative information from the record.

Although a 69% majority said they do not feel their personal right of privacy has been violated by credit bureaus, a substantial 28% feel they have been victims of either misleading, damaging or incorrect information stored in a credit bureau's files.

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Park Reservation System Canceled

WASHINGTON, D.C. – Ronald H. Walker, director of the National Park Service, has cancelled a contract for a computerized campsite reservation service designed to allocate space to campers in 21 national parks [CW, Aug. 21].

The contract with Park Reservation System, Inc., Cedar Rapids, Iowa, ended Aug. 29, but all campsite reservations made to date will be honored, according to Tom Wilson of the National Park Service.

Some reports noted the action followed hearings held in late August by Sen. Howard M. Metzenbaum (D-Ohio) on complaints from campers about the inefficiency of the system. The hearings disclosed that Walker and L. Donald Middleton, president of Park Reservation, are friends and that other companies capable of providing the service had been turned down.

While he acknowledged his friendship with Middleton, Walker testified the relationship hadn't affected the contract.

Wilson claimed the contract was terminated because the park service "couldn't come to terms with the firm on a long-range agreement." He said negotiations were stymied by "personal matters involving company officials."

No technical problems existed with the computer system that "the park service couldn't live with," commented Wilson. He noted, however, that some people question whether the park service can afford to computerize campsite reservations in the long run.

Plans are under way to begin a study evaluating this year's expansion and operation of the system from six to 21 parks. The study will be conducted both in-house and with outside assistance, although the Park Service hasn't hired anyone for the job as yet.

Wilson expects the report will be completed within the next month.

Grand Central Commuters Catch Cash on the Way to the Train

By Toni Wiseman

Of the CW Staff

NEW YORK – On-line and remote banking systems could be connected to hundreds of airports, train stations and bank branches within the next year if the idea of the automated branch catches on.

Chase Manhattan Bank installed its first automated branch in Grand Central Station just after Christmas last year, enabling thousands of New York commuters to withdraw cash and conduct other financial transactions at automated walk-up terminals.

Chase has found a receptive market for cash dispensing services, stated David H. Larsen, second vice-president. "Our volume figures exceed our projections significantly," he said. "We expect to extend the service and concepts to additional locations."

In discussing Chases's equipment selection, Larsen said while various major vendors offered equipment, only a few had on-line equipment and only a few could deliver within the specified time requirement.

Chase finally chose Docutel equipment because of its satisfactory performance record with other banks and because the firm responded favorably to the on-line and time requirements.

"We selected the Docuteller Cash Dispenser as opposed to a Total-Teller because we believed that 90% of machine usage would be for withdrawal-only transactions," the Chase executive stated.

"We further believed that transfers between accounts would not represent any significant transaction volume," Larsen said, adding that Chase had made a separate provision for deposits with the installation of a machine for this purpose only, an Instaposit Machine.

The advantages of the Docutel equipment include the ability to generate a customer receipt, the ability to provide off-line backup to an on-line system and the ability to read an ABA magnetic strip, he commented.

Some 500,000 Chase checking customers and 1.5 million BankAmericard holders can use the equipment.

To use the system, the customer inserts his Chase BankAmericard or Convenience Card – a customer identification card – and keys in his four-digit personal identification number plus the desired dollar amount.

The computer verifies the level of funds in his checking account or his charge limit depending on the card he has chosen to use.

The concept of the automated branch compares favorably with teller staffed branches, Larsen said, in that customer services representatives staff the automated branch to assist customers with understanding and using the machines. Customer education is a must if the system is to be accepted and work effectively, he emphasized.

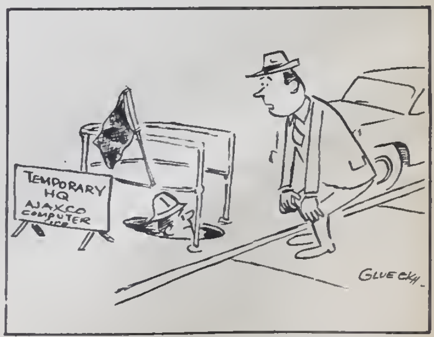
"Our machines do not make change or accept 'split deposits,'" Larsen said. "However, our machines are available to provide cash for extended hours of service. This is something that live tellers are not always able to do."

The Grand Central branch cost less to construct than a typical branch, he asserted. The machines there are capable of doing more transactions than a live teller – up to 500 each hour – and can do so for more than eight hours a day.

The cost of the cash dispenser amortized over a number of years is "far less than our lowest paid teller," he added.

Downtime for the system has been negligible so far, Larsen said – one hour in June and one in July. During computer/communication downtime, the system reverted to the off-line mode and continued to dispense cash.

The Chase machines have a record volume of transactions for the country, the bank reported. Because of the great amount of usage, the actual cash dispensing machines have gone down or were taken down numerous times for routine maintenance, Larsen said, but he added that relative to volume, Chase is fully satisfied with performance.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Cattle, Maple Syrup, System/3 Send Ex-Analyst Back to Nature

By James Green

Special to Computerworld

NEWPORT, Vt. – John Miller, a former IBM systems analyst, has "gotten away from it all" with his family, some farm animals and a System/3.

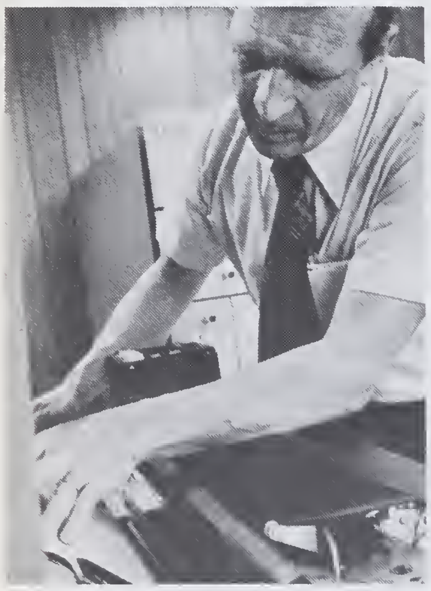
Miller left his job at IBM in 1970, moved to this tiny town (pop. 5,000) near Vermont's Canadian border, and now milks his computer to keep up his farm.

It's an idéal situation for Miller, who began his professional career as a forester and never lost his love of the backwoods. Now he's having his cake and eating it too – enjoying rural life while he runs a nicely expanding computer service bureau.

After earning forestry degrees from Syracuse and Yale, Miller spent 10 years with the St. Regis Paper Co. He became interested in computers in the late 1950s, when St. Regis began using a computer-controlled inventory system to keep track of tree growth and productivity.

He was fascinated enough to resign his job and begin training as a programmer with IBM in New York. And there he remained for another 10 years until the call of the wild led him and his family to Vermont.

Miller bought a 130-acre farm and embarked on his third career: farming. Cattle and maple syrup became the Millers' main source of income, supplemented by chickens and a few pigs.


Miller programs computers for local businesses from his farmhouse computer center in northern Vermont.

In January of 1972, after working part-time for a while as a substitute teacher at North Country Union High School, Miller took the job of data processing director for the school district. He wrote programs to integrate the school's academic and vocational scheduling, run payrolls and administrative programs and teach programming techniques to business students.

It was during his tenure at the school that Miller began to see the potential for a private computer service. Local businessmen often made request for assistance from the school.

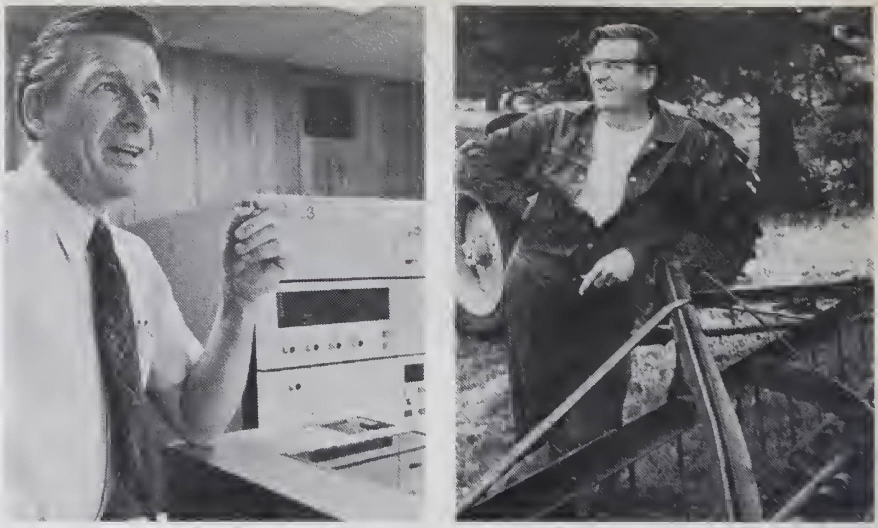
Miller takes time out from his computer center to look after some of his farm animals.

About a year ago, he finally decided it was time to strike out on his own once more.

Miller leased an IBM System/3 Model 5410 and opened for business with three basic packages. His billing, payroll and accounts receivables package – the most popular – is used by a dairy, a farm machine manufacturer and a ski clothing producer, among others.

The second package is used mostly by lawyers and CPAs to keep track of unbilled time and accounts receivable. And the newest program, an outgrowth of Vermont's land boom, is designed for surveyors.

In tiny Newport, Miller doesn't have to worry about local competition. His cachement area extends 50 miles and he sees definite growth potential in the "neighboring" cities of Burlington, Vt., and Sherbrooke, Quebec.


John Miller finds it possible to have the best of both worlds. He started working in computers, then switched to farming and now he works at both.

If growth continues at its present 10% per month, the System/3 will soon have to work a second shift.

Having been forced more than once to shut down computer operations to chase runaway cattle, Miller has sold most of his livestock. But he still has his farm, his sugarhouse, some cattle and, – to hear him tell it – his peace of mind.

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Arts III Traffic Control Now Established in 61 Airports

WASHINGTON, D.C. – The initial phase of a Federal Aviation Administration (FAA) program to automate air traffic control has been completed with the installation of an Automated Radar Terminal System (Arts III) at California's Oakland International Airport this summer.

Automating control within a 50-mile radius of airport terminal areas, Arts III has been installed in 61 high-to-medium density airports in the U.S. by Univac. In addition, three FAA facilities have been supplied with the computerized system for research and training purposes, according to a Univac spokesman.

Arts III assists the air traffic controller "by automatically displaying identity, speed and altitude of aircraft in alphanumerics next to the target blips on his radarscope, the representative said.

He noted that prior to the joint Univac-FAA effort to develop Arts III, "blips were anonymous, and controllers communicated verbally with pilots for such information."

Awarded the $51.3 million FAA contract in February 1969, Univac proposed building the basic system on a modular basis so that it could be tailored to fit individual airports, the spokesman commented. While cost estimates for completion of the project rose to $60.9 million in mid-1970, he said the contract price has remained constant since then.

Adaptable

Univac developed two typical Arts III configurations that could be adapted to the size of an airport's traffic count.

Designed for commercial airports with up to 175,000 flights each year, the single system can simultaneously track 40 beacon targets, aircraft equipped with transponders which measure and transmit the plane's altitude.

Multiple work station positions can be utilized in this Arts III configuration, using a horizontal radarscope.

Capable of tracking up to 180 commercial flights at one time, the dual beacon system was built to accommodate airports with more than 175,000 takeoffs and landings each year, the spokesman explained.

Based on a computer designed specifically for this application, the Univac 8300 or Arts III Univac, the single system carries a minimum memory of 24K while the dual system begins at 40K, he added.

The first single system was delivered to the FAA's Oklahoma City Academy in December 1970. Dual systems have been installed at airports in Chicago; Los Angeles, Sacramento, Oakland and Santa Ana, Calif.; Dallas-Ft. Worth, Texas; Miami and Jacksonville, Fla.; Washington, D.C. and the FAA test bed in Minneapolis, according to the spokesman.

Overseas

In addition Arts III has been purchased by the Japanese government for installation at Tokyo and Osaka and by the U.S. Army for its aviation unit at Fort Rucker, Ala.

The spokesman noted that most of the demand for Arts III was satisfied with the completion of the contract for the 64 U.S. installations.

"Certainly some market possibilities exist in the rest of the world," he said, "but most international airports outside this country don't have a high enough traffic count to make their use of Arts III practical."

Jury Selection System Hangs Up Murder Trial

EL PASO, Texas – A two-year-old technicality in the county's choice of a computerized jury selection system finally affected the course of a case being tried here in July.

On behalf of their client who is on trial for murder, two attorneys filed a motion charging the county with using a jury selection method that had not been approved by the County Commissioners' Court as required by state law.

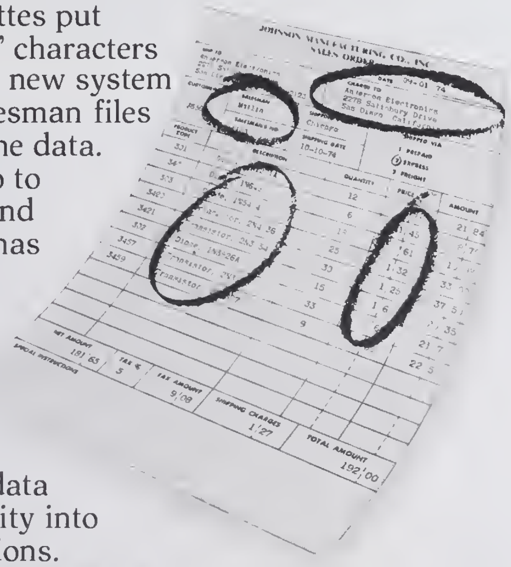
A check of court records found no written approval of the computerized selection system since the first jury list was issued by the Univac system in May 1972, a courthouse spokesman said.

He claimed the Commissioners' Court did approve the system, but that for some reason this go-ahead wasn't included in the minutes. Two weeks after jury selection was automated, he said the minutes showed an order for system supplies.

Even though approval of the system was implied, without written consent, Judge Sam Callan granted the lawyers' motion and reset the trial for this month, according to the spokesman.

The validity of one other case, involving a man convicted on a misdemeanor obscenity count last April, has also been challenged on the basis that "the jury was selected by a means other than provided for by the laws of Texas."

System approval has since been incorporated into the minutes, and the court has held that persons tried since May 1972 should have filed any challenges to the jury at the time of trial.



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Work/Study Program Trains Minorities

LOS ANGELES – Pepperdine University and Telco Institute of Urban Technology, (Tiut) a black-owned vocational training school here, have received a grant from the Department of Health, Education and Welfare (HEW) for the continuation of a post-secondary education program aimed at minority students.

Under the $215,000 HEW grant, the two institutions will enroll 30 students in a special two-year course leading to Associate of Arts degrees in computer programming/systems analysis and computer maintenance.

The training, which combines study with actual vocational experience in a simulated work atmosphere, will be given at Tiut's facilities, while the liberal arts academic subjects required for the degree will be taught at Pepperdine's Los Angeles campus, which adjoins the Telco facilities.

The concept of combining the vocational training offered by Telco, whose computer courses are accredited by the National Association for Trade and Technical Schools, and the academic studies offered by Pepperdine originated in 1970 when the two schools used their own funds to develop the program.

The purpose of the course is to provide an integrated academic and technical education which will develop salable occupational skills simultaneously with academic competency.

"All too often, minority students overlook the need for continuing their education beyond the high school level because they grow tired of straight classroom study," said Booker T. Thomas, Telco president.

"But when academic studies are combined with vocational training, a student often is motivated into pursuing his education at a higher level because he feels he is actually accomplishing something," he added.

"Several of the graduates of the two-year program continued their college studies at Pepperdine and received BS degrees in business with data processing majors," he noted.

The joint Pepperdine-Telco program was one of 100 accepted for HEW grants from several thousand institutional applicants.

Thomas has been closely associated with Pepperdine since 1966 when he acquired the small private training school.

Before entering the technical education field, Thomas was a project manager in the Apollo program at the Space and Information Systems Division of North American Aviation and a computer scientist for Systems Development Corp. While in the Air Force, he received a commendation for computer management skills.

Computer Busing Saves Thousands

NEW PALTZ, N.Y. – Using a computer, the school district here has managed to shave between $33,000 and $55,000 from student transportation costs.

In addition to lowering the 1970-71 transportation figure from $218,000 to a 1973-74 cost of $181,000, "computer busing" has also permitted a decrease in the number of buses used from 30 to 23.

In return for providing the computer with child and road locations, the number and speed of buses, the number of children involved, the number of stops to be made and the distances to be traveled, the district receives a route summary indicating the most efficient means of moving students between school and home.

The initial cost of compute busing was $1,200 and since then has cost 50 cents a student annually, totaling about $1,000 for 2,500 students.

Student Data Base Enables District To Assign Bus Routes

HAMMONTON, N.J. – Efforts to put all resident students on a master file led school district officials here to computerize the school transportation system as well.

"Once we created a data base identifying all students in the area, we could easily determine who should walk and who should ride to school based on the boundaries established by the district," commented Thomas Monzo of Hammonton's Board of Education.

"While we may spend more money using a computer to assign pupils to pickup spots," he continued, "we believe we have a more efficient system, providing savings measured in fewer stops."

Under the new system, every student eligible for the service will be assigned to a particular bus stop. Drivers will no longer stop at the home of each child, according to Monzo.

When they do stop, drivers will know how many students to pick up and who they are, he added.

A pilot program, the busing plan began with the division of the municipality into a grid composed of areas one tenth of a mile square. Within each area, bus stops were established depending on the density of the population and the traffic level of the streets involved, Monzo explained.

"We worked with the Hammonton police to locate and avoid dangerous streets," said Robert J. Colucci, DP manager at the Atlantic Community College and a member of the Board of Education.

Responsible for the applications software for the project, Colucci also noted efforts had been made to cluster students around stop locations reasonably central to each individual.

Run on an IBM 1130, the busing program involves 40 bus routes and some 1,400 people out of a total student population of about 3,000, he said.

Because of Colucci's connection with the school board, the district was able to have the software written free of charge. He said a job this size would normally cost $5,000.

The school district will probably pay for machine time on the college's computer, and may find room in the budget for acquiring its own system, Colucci said.

Monzo noted the master list of students attending area schools gives the district the ability to develop a variety of applications in addition to transportation.

Poison Center Pinpoints Data

DENVER, Colo – A computer at the poison information center here provided medical personnel with critical information on parathion poisoning when several persons were hospitalized following exposure to the site of a crop duster crash last month.

Receiving descriptions of the symptoms of the ill persons, the computer produced information about parathion, a commonly used but highly toxic insecticide, within 25 seconds.

Located at the Denver General Hospital, the computer was installed several months ago and is part of the National Center for Poison Information.

Developed as Public Service

On-Line Election Returns Cut TV Stations' Rivalry

By Edith Holmes
Of the CW Staff

MEMPHIS, Tenn. – An on-line election return system here has eliminated competition between three commercial television stations to be the first to provide viewers with local precinct and state vote tallies.

Devised by Data Communications Corp. (DCC) as a public service to the TV stations, the system proved successful in Tennessee's Aug. 1 primary and will be used again for the November elections, according to Bernard DeGuzman of DCC.

Following the general election last autumn, management from all three stations met and discussed "the advantages of pooling resources and receiving the same information at the same time," he said.

DCC developed a software program capable of receiving precinct totals for all contests, adding it all up and displaying this information either on CRT units or on printouts. DeGuzman estimated the project cost the firm approximately $10,000 and two man-months.

He explained that at DCC, eight CRTs are used to update candidate files contained in a Burroughs B4700.

Updated Tallies

Meanwhile, at each of the stations, WMC-TV, WREC-TV and WHBQ-TV, Data General Nova 210 minicomputers receive updated vote tallies. Either Hazeltine CRTs or Centronics printers then display the information, he added.

Because they were already on DCC's Broadcast Industry Audit System, BIAS, which schedules commercials, two of the stations had the necessary hardware for the election return system. The third station, WHBQ-TV, split the cost of installing the Nova 210 with DCC, according to DeGuzman.

During the August primary, Memphis Jaycees manned the 216 precincts, phoning in the totals to DCC as soon as the voting machines had been closed and tabulated. Thirty telephone operators then intercepted the calls at the DCC offices, passing their tally sheets to the CRT operators.

Passed Along

The eight input operators entered these totals into the central computer, which processed the data and passed it along to the station's minis.

DeGuzman commented that every transaction entered into the system was printed on a Burroughs line printer, creating an audit trail that would permit easy correction of any wrong tally.

The same procedure will be used in November. But while both methods of display were used during the August primary, DeGuzman said the stations plan to use CRTs exclusively during the November election. These units, he noted, can be scanned directly with color TV cameras.

Expansions

In addition to covering the returns for Shelby County, the area surrounding and including Memphis, the system has been expanded to incorporate wire service information on statewide returns. CRTs will also display vote tallies with greater speed in the fall than they did in August, DeGuzman said.

Eventually, DCC "would like to provide the stations with the capability to update their own files using their mini machines alone," he commented.

The company anticipates that with these refinements to the system, it should be able to market the election return package nationally. But, DeGuzman added, these developments are probably one to two years away.

Blue Cross Installs Tape-to-Tape System For Outpatient Claims

BOSTON – Blue Cross has put into operation a new system for processing outpatient claims provided on tape by three different hospitals using different types of tape and equipment.

Under the new system, hospital personnel merely key claims information, via CRT terminals, onto a tape in their own DP center.

The tapes are then delivered to Blue Cross, eliminating completely the submission of paper claim forms.

The hospitals are responsible for editing their tapes to catch errors or missing information before delivery to Blue Cross, but otherwise there are very few restrictions, according to Dennis Ruggiere, senior programmer analyst in Blue Cross' data acquisiton method department.

"Blue Cross provides participating hospitals with a user's guide containing exact tape preparation instructions, field by field," Ruggiere explained.

"As long as they follow the guide, we don't care what kind of tape they use – 9-track, either 800- or 1600-bit/in., OS or DOS, Ebcdic or Ascii," he said.

"We also can accommodate 7-track 556- or 800- bit/in., OS or DOS, Ebcdic and Ascii," he added.

Three Main Advantages

The new system reduces the time needed to process a claim from the previous minimum of 16 days to as few as five days, according to Ruggiere.

Increased accuracy and efficiency of processing claims and the elimination of paperwork by both the hospitals and Blue Cross are two additional advantages.

Since beginning their automated claims processing system in June 1972, claims rejected for incomplete information have dropped about 28%. Further improvements are anticipated under the new tape-to-tape system.

Participants include Massachusetts General Hospital, Peter Bent Brigham Hospital and Brockton Hospital.

Testing will soon be started by the Massachusetts Hospital Association, which provides billing service to 22 member hospitals, the Boston Department of Health and Hospitals, the Association of Catholic Hospital Computer Service, and the SDK Medical Computer Service.

Blue Cross uses an IBM 370/158 and 370/155, each with 1M byte of core, two 7-track tape drives, 18 dual-density 9-track tape drives and two 3330 disks.

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Students Explore DP Careers

LOUISVILLE, Ky. – Thirty-five students from 19 area high schools here are discovering what it's like at the business end of a computer.

In an effort to encourage students to consider a data processing career, the Tube Turns Division of the Chicago-based Chemetron Corp. has developed a course which explores the field from the preparation of input data to the design of computer systems.

Students meet with eight systems and DP employees from the division twice each month on a year-round basis. The class has access to an on-line data collection system linking Tube Turns' 10 manufacturing control centers to the company's main computer, he explained.

Following introductory sessions in current technology and a review of numbering systems used in various types of hardware, students are taught to program using Cobol. The spokesman said in addition to running their programs on Chemetron's computer, students also learn how to operate the hardware and to solve system definition problems related to basic business needs.

Sound of a Dog Barking...

Citizen Complaints Get Prompt Action

By Nancy French
Of the CW Staff

SAGINAW, Mich. – The average citizen here who calls the city to complain about a neighbor's barking dog would probably be amazed at the action initiated by a single complaint call.

Each complaint is processed through a maze of bureaucratic channels that culminates in an investigation within three days, allows the citizen to rate the city's response and prints out a computerized follow-up report to help the city manager rate the work of city departments.

"Solving citizens' problems is one way the city government tells its taxpayers they're getting something for their money. Documenting the city's response lets the city manager know what kind of job each department is doing," explained Don Stahr, director of the city DP operation.

As for calling in complaints, there's no citizen confusion. All complaints come through one office – the Bureau of Public Information and Complaints (BPIC).

About 2,300 Saginaw residents call to complain about something every year, Stahr said.

Complaint Process

The complaint process works in the following way.

When BPIC receives a complaint, five copies are made of information recorded by telephone answering personnel. Information recorded includes the complainant's name (which is kept confidential), according to Gerald Werle, the community information officer; the date, time and category of the complaint; if personal contact is advised; where the complaint is referred and a deadline on what action must be taken.

One copy goes to the complainant who also gets a postcard on which to rate handling of the complaint as satisfactory or unsatisfactory.

"The postage-paid postcard is returned not to the department head responsible for the case, but rather directly to the City Manager's office, Stahr explained, to assure that complaints get attention.

At one time, the city police department was saddled with handling complaints. Instead of fighting crime, police officers spent hours haggling over rubbish and other neighborhood gripes, but not since BPIC took over the time-consuming work.

Craig Quimbach, complaint investigator, can obtain a legal complaint when necessary, as in the case of removing a junked car. When this action is taken, the offender is legally bound to remove the junked car or litter.

If the property owner fails to comply, the city will do the job and send him the bill, Quimbach explained.

Permanent Record Made

Although the person making the complaint usually forgets about it when the matter is straightened out, the city's DP department makes a permanent record.

Each day complaint sheets are sent to be keypunched. As postcards are received from citizens, they, too, are keypunched.

At the end of the month the batch is processed, and a complete report gives the city manager a pretty good idea of BPIC's action or inaction that month, according to Stahr.

"Right now the processing is done using punched cards and an IBM 370/135," Stahr said.

"Next month we're getting a 3270 CRT up in BPIC, so then we'll begin to go real-time," he added.

Who's Complaining?

Who usually complains?

Reports show that 787 complaints were received in the first four months of this year. Of that total, 506 were registered from men, 261 from women. For the 787 complaints, 593 personal contacts were made by investigating city personnel.

Werle noted, however, that a large number of the complaints may come from the city's roaming inspectors who are on the lookout for violations.

"City employees, while on business, often initiate the complaints," he said, "and often complaints are neighbor against neighbor," Werle explained.

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On-Line Network Rushes Service To Fort Worth Water Customers

By Ken D. Wood
and Robert E. Sealy
Special to Computerworld

FT. WORTH, Texas – When residents here call the city's Water Department for service, they receive an answer in four minutes – five minutes faster than a year ago. And the typical "What's my bill amount" question is answered in just seconds, not two minutes as before.

The secret weapon: an on-line computer network that is providing the most efficient water service in the city's history, as well as improved flexibility, accuracy and control of cashiering, reporting and virtually every other facet of the Water Department's operation.

While these savings per call may not appear impressive, this is the first summer in years that the department has not received complaints that customer service circuits were busy and callers couldn't get through.

When a resident calls for service, any customer clerk can now display that customer's file on an IBM 3277 visual display terminal, on-line to a central IBM 370/145. In the past, clerks could only take calls from customers whose address cards were in a tub file.

Similarly, when a new customer comes in and puts up his deposit, a clerk at the walk-in counter makes all necessary changes in premises and customer information immediately via a terminal.

This is possible because there is now a single computer data base containing all Water Department data that was in up to eight files before.

The customer service clerks also handle inquiries without leaving their desks or even putting customers on "hold."

Typically, if a customer calls in to request a repair or a change in water service, the clerk just keys in the premises address on a CRT.

After it displays the account number, the clerk transmits the service request data to the meter shop. There, requests are printed within about five seconds on one of two IBM 2740 printers. These transmissions simultaneously update all computer records related to the customer, premises and billing.

The order is dispatched from the meter shop via radio, usually within five minutes. After the order is completed, the filled-in copy is returned to the customer service department and the completion data is keyed in, again via a display terminal.

The advantages of the on-line system's flexibility are nowhere more apparent than in the cashiering department. Although two clerks at the back of the cashier's cage work solely on entering mail payments through their visual display terminals, the cashiers at the three windows can handle both mail and walk-in payments. They key in the mail in batches, but anytime a walk-in customer comes to the window, the cashier enters his or her payment by keying in another batch number, then goes back to handling mail items.

In the past, the department used a smaller, card computer with tub files and a cycle billing system complete with built-in delays, such as a 30-day lag on data about receipts and balances. It also required seven-day "suspenses" on data entry while each cycle was billed. As a result, orders that weren't filled out and uncorrected bills were sometimes not caught until after a month had passed.

Billing is still done in cycles, but all entries are immediate, updating the single data base.

The department has also eliminated 116,000 duplicate bills formerly produced monthly to serve customers who came in to pay without their bills. Today a duplicate bill is prepared on a printer in the walk-in customer service area only for the customer who comes in without the bill.

Another terminal is in mail processing, used for inquiry when a bill and the check accompanying it don't match. Three terminals are in administration where they are utilized to service customer complaints, enter changes, make inquiries, etc.

Also, two printers are located in that department, one to produce duplicate bills that may be needed, the other for delinquent cutoff work orders and miscellaneous printouts when a hard copy of a display is desired.

The terminals were installed Jan. 1, 1974, and went into full operation May 1. Since that time, the system has had less than half of 1% downtime.

The Water Department represents only about 50% of the total on-line computer volume. The 370 also serves the Tax Department, Municipal Courts, Police, Budget Department, Planning, Accounting, Payroll, Personnel and Public Works.

In addition to video display terminals, the walk-in customer service is equipped with a printer used to produce a duplicate bill for every customer who comes in to pay without a bill.

Automation has also meant clerical savings. Forth Worth has 4,132 employees, virtually the same number as five years ago, despite growing population and work volume. Automation's benefits are particularly visible in the larger offices like Tax, Accounting and Water.

Ken Wood is manager and Robert Sealy assistant manager, customer service for the Fort Worth Water Department.

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Editorials

'Do It Yourself'

An old idea in the computer community seems to be on its way back – "do it yourself" maintenance.

In the very early days of computers the user was as much a technician as his vendor service representative, who was often a live-in feature of the installation.

A recent speech by an IBMer in Stockholm indicated future mainframes might be largely maintained by users calling up remote diagnostic centers to run test programs and receive instructions on needed repairs.

Less than a month later, an independent memory vendor – Cambridge Memories Inc. – announced a memory for 360/25 users that the users can install themselves and even maintain themselves with great cost savings.

Both moves point in the direction of user-maintained systems.

The idea holds a great deal of promise, but there are possible traps long the way.

As systems become more modular – which appears likely – it will be easy for a user to isolate faults and plug in the necessary replacement boards, possibly within a matter of seconds, without waiting hours for a service rep.

But remote diagnostics could also serve to tie the user closer to one vendor or lock him in, which would seem to be counter to the move away from vendor dependence that has taken place over the past few years.

There is no real indication today as to the direction that will be taken by these new maintenance ideas.

But users should keep a watchful eye to make sure the trend opens rather than shuts the doors of their installations.

Privacy Commission Needed

Senate and House committees are in the process of approving bills that would place limitations on the collection and dissemination of personal information in federal computerized data systems.

Both bills seem to be workable and fair considering the current political climate, but there is a serious difference between the two measures.

The Senate proposal would establish a privacy commission of five independent experts to help interpret the meaning of the bills and to propose regulations for the operation of private data banks within three years.

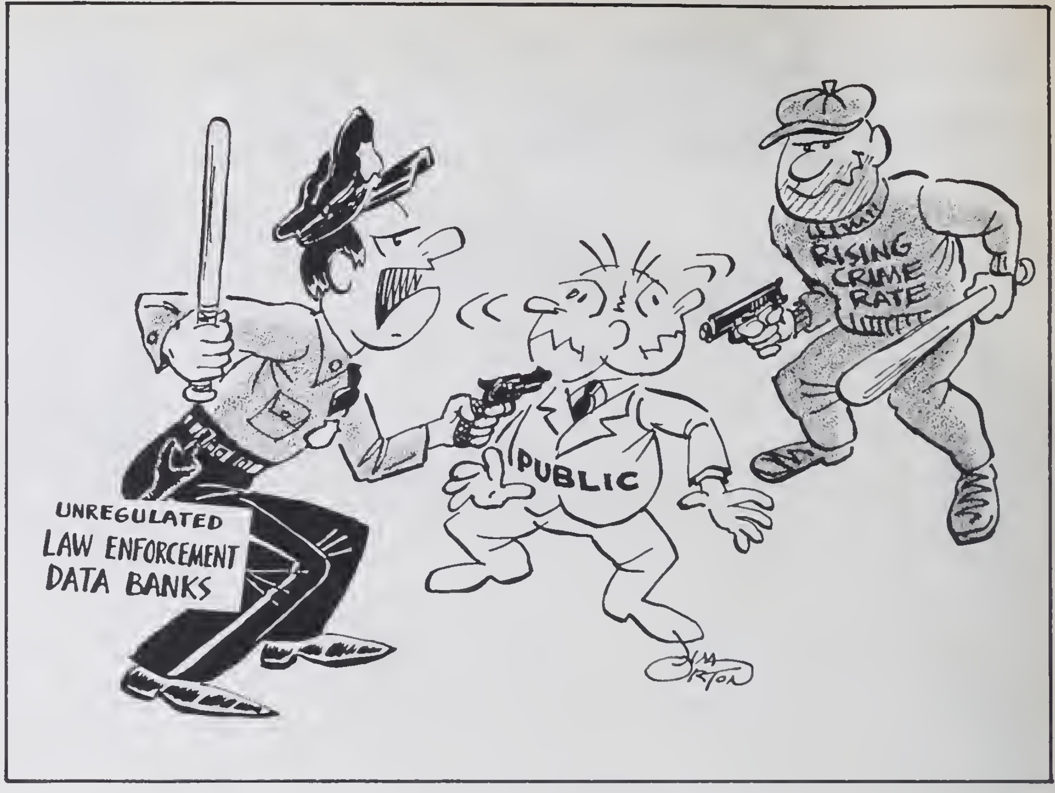
The House group has chosen to leave this provision out of the measure it is expected to approve this week on the theory that such a body would be expensive and that the Domestic Council Committee on the Right to Privacy is performing many of the same functions of the proposed new group.

The Domestic Council is doing an excellent job, particularly with its new visibility in the Ford Administration.

However, a truly independent agency is needed to study the privacy issue, particularly in the private sphere. Just because there is a new mood of cooperation and concern in the White House today does not mean there will never be a reversion to the unconcern shown in the dying days of the Nixon Administration.

The best way to make sure an entity like the Domestic Council remains independent and concerned over privacy is to isolate it as much as possible from the political pressures of the White House. An independent commission such as the one proposed by the Senate privacy bill (S-3418) could best serve this need.

The House as a whole should amend its committee recommendations and include the privacy commission in its privacy bill. If that fails, the Senate should insist on the provision when the bills are in conference between the two houses.



'Halt or I'll Shoot!'

Letters to the Editor

Private Schools Provide Service By Filtering Out 'Bad Seeds'

To burden educational institutions with the entire responsibility of educating students is a gross evasion of the very purpose by which society established the educational system.

Jerri Burket's letter [CW, Aug. 14] touched upon a main issue in the debate over the worth of private DP schools. While attending a private DP school, she observed a lack of interest from the majority of other students in taking advantage of free instruction and use of DP facilities available after regular school hours.

In shunning the educational opportunities available to them, the students defeated their own purpose. Students also share in the responsibility for their education.

If a student fails to investigate the related industry and schools associated with the chosen field of endeavor, then we can only assume he does not wish to be burdened with those particular responsibilities.

Employers are first aware of an applicant's desire and interest through his educational background and experience in his chosen career.

The DP field is benefitting from a service of which the private DP schools may not be aware by weeding out the "bad seeds" before they enter the field. The "bad seeds" are those not showing a real desire and interest in the DP field.

Gene M. Leonard
Computer Operator
Intercraft Corp. Industries
Glendale, Calif.

Service/Support a Major Factor In Vendor Equipment Evaluation

Hats off to Donald W. Beatty, who supported the reasons for IBM's 70% share of the EDP market [CW, Aug. 28]. It is people with his logic and open-minded approach that seem to evaluate "other than" vendors.

Support is a major factor in equipment evaluation and certainly should affect the final decision. If Beatty is looking for the support level offered by IBM then he should (and probably will) stay with IBM. Should the day ever come when he makes a non-IBM decision, let him explain to us the reasons why IBM will go over his head to discredit him and his decision to his superiors as their past experience indicates they will.

"Cheap imitation and one man per state.": I merely mention this as further proof to this man's ability for original thought. Does he realize that in disk units alone voice coil actuators and glass read/write heads were used on 2314-type disk units before IBM copied them on the 3330s?

Is he also under the impression that IBM was first in monolithic memory? Does he read the surveys that show the vast majority of "plugs" users are satisfied and IBM places last in price/performance.

Finally, the money saved by using plugs is a positive bottom line adjustment and most managers are supposed to be working toward a better bottom line.

Warren M. Harris
Bethlehem, Pa.

Will Real Charlatan Stand Up?

I read with interest, the anonymous letter in the Aug. 21 issue of *Computerworld* from an apparent disciple of Tom O'Connor.

Like so many other cry-babies, the writer chose the cloak of anonymity to protect himself from having to answer the question, "Just what the hell are *you* doing to overcome the problem *you* say exists?" I suspect if this foreteller of doom were identifiable, his answer would be vague at best, since it is most difficult to come up with the solution to an imaginary problem.

Even if the problem were real, how can we join forces with the "fighters" who have "real leadership" when they won't even identify themselves? To request that one's name be withheld is not a leadership quality – but rather one of the qualities of a charlatan threatened with exposure and expulsion.

I instinctively distrust someone who prepares a list of alternatives, in order of personal preference, and then presents that list upside down. There's a tricky mind at work here

Will the *real* charlatan stand up and be identified?

J.E. Sands
Manager, Business Systems Development
Carpenter Technology Corp.
Reading, Pa.

Single User Group Not Practical

The editorial about DPMA [CW, July 17] sounded just like Herb Grosch's theme in his *Business Automation* article of August 1971. Is he again attacking DPMA because of its leadership in hopes that by reducing its effectivenesss he can foster his own scheme of an American computer society?

The diversity of data processing interests would make an organization Grosch envisions an unwieldy mass of 200,000 members.

I do not believe there is anyone capable of organizing and then controlling such a gigantic group because there could be no leverage applied except through a law forcing everyone to belong.

Robert R. Hamilton
Boston, Mass.

Herb Grosch had nothing to do with the editorial in question. His column – White Hats, Black Hats – is his personal view and not necessarily that of the paper. It was there he made the suggestion for a new users group. Ed.

Other letters and viewpoints on Pages 15 and 16.

Letters to the Editor

Playing '20 Questions' Not a Favorite Game

It is gratifying to see so many of your eager contributors busying themselves with the big problems of the DP world: analyzing programmers, classifying programmers, etc.

I wish I had problems like that. I'm a programmer and my biggest problem is the lack of maybe-branches in the instruction sets.

Since management often doesn't want to commit itself to specifications, I resort to the "Twenty Questions" procedure, e.g., "Do you want asterisks all over your hash totals?" "Maybe."

"Do you want the headings in binary?" "Maybe."

In my current project I have several hundred of these maybe-specifications. As a result, it takes a week to edit the transaction code, and we aren't even sure what it *does* yet.

My poor, innocent 370/135 is only a year old, still a virgin, and just can't get the hang of all these games. After I gave it a conditional instruction to branch more or less on equal on Friday the 13th in leap years unless it's raining in Encino, all the king's horses and all the king's men couldn't put EREP back together again.

Until the high-level engineers come up with some maybe-instructions to go along with the maybe-specifications, high-level management will continue to get what it richly deserves.

Maybe there is justice in that, after all.

Pat Jacobs
Burbank, Calif.

Industry Lacks Voice

After reviewing the hundreds of associations in the country protecting special interests, I believe one is missing. Specifically, I believe an association should exist where companies who have purchased equipment from computer vendors can obtain protection for their interests in this equipment in the future.

This organization should be called The Computer Owner/Users' Association. Special interest groups exist for leasing companies, used computer dealers, programmers, computer hardware manufacturers, etc. Let's have the user/owner be protected also.

Without a uniform voice this particular aspect of business in the computer field is being ignored but is contributing almost 50% of the revenue to the computer field each year.

Today the user/owner is insulated and isolated and must take whatever the IBM organization offers.

George S. McLaughlin Jr.
Summit, N.J.

Staran in Europe

One of the unexpected dividends of my long visit to the Ifip and ICCC conferences in August was the discovery of a new outpost of radical computer architecture. Staran, poor neglected child of Goodyear Aerospace, has proponents on the Continent: Integrated Computer Systems AB of Stockholm.

This agency, run by Ulrich Schroeder and Bertil Martinsson, represents other computer interests also, but my excitement was that associative processing was being offered.

Ever since I heard Jack Rudolph do his piece at one of the better Joints two or three years ago, I've been dreaming about the new ecnomics and the reduced software of such a completely novel machine.

Far more than an array processor or pipeline hardware, the replacement of the more-than-a-century-old pigeonhole memory concept with content-addressed storage turns things upside down. The new departure is not free – we couldn't afford it in the first generations, or with cryogenics: IBM tried.

But chips, per bit stored or per switch activated, are incredibly cheap. I believe cost is no longer an obstacle.

Goodyear has put out a new brochure, which I saw for the first time in Sweden. They offer 32 modules of memory, much more than in their FAA machine. They talk briefly about software, about training, about customer support.

The ICS people are at home in airline and related application areas – meteorology, for instance. So is Goodyear, back in Akron.

But what I want to see is someone making a major investigation of a business file management job: an insurance company, a European government social security administration, a big bank chain. We need data on setup time, on run times. We need recommendations on word size, now 256 bits. We need planning and experience on interconnection to "regular" computer systems for other than air traffic control.

Goodyear hasn't pushed in the U.S. and IBM would probably swamp prospective customers if they tried. I wonder if the less heated computer environment of the UK and the Continent might provide a better seed bed?

Perhaps an alliance with ICL, which for a change seems to be doing better with a new machine (the 2903), or with a different kind of giant like Philips could speed things up.

I was told that IBM has a team studying the concept. I'll bet the Japanese have also. I myself tried to tout it to Texas Instruments early in 1973. Here is an opportunity for a major force or forces in the user community to strike a blow for freedom.

The iron is hot!

Herb Grosch

DP: A Profession of Its Own or Service to Others?

By Willie Grafals
Special to Computerworld

Data processing has been in a quandry with respect to its status for many years. Proponents of professional status attempt to equate DP with the accepted professional fields which have stood the test of time and have existed as entities through many evolutionary and revolutionary periods.

"Ethics and standards for the protection of the consumer and the user" are also arguments often heard, but through it all I have detected undertones of intellectual bigotry.

I believe we have to use vision and common sense, if not pure logic, and grasp the truisms of this unique field of which we are a part, so that we do not fool ourselves nor our intentions for seeking professional status. I also believe the very technology which has been responsible for DP as a body will eventually make the question of professional status an academic one.

The very essence of computers is to replace mental and, more recently, even physical tasks performed by human beings. I can therefore accept the fact that our functions can and will someday be fully automated.

Even now the technology is being developed that will supplant the programmer's task, and while some may argue that the systems analyst is here to stay, I submit that the systems analyst has been around even prior to computers; he simply carried a different label.

The field of "people management" is perhaps one of the oldest unrecognized professions in the world and it is destined to continue along with the various forms of systems analysis. However, DP as we know it now and think of it will be replaced by the fulfillment of the closing of the technological gap it has helped to fill.

I can envision a future in which the end user, without our aid, will verbally direct the performance of a job or function through the use of highly technical interacting systems of hardware and software which will have many, if not all, the capabilities now being supplied by us.

Science fiction? As inventions have played upon inventions, the speed of change has accelerated until time lags from one development to another have become shorter and shorter. Computers themselves have been outstanding in their contributions to the speed of change, and our own behavior or lack of it, has been responsible for the directions now being taken.

Some Comparisons

If you find it difficult to accept this premise then try to make a few comparisons of DP and the recognized professions. In addition to having stood the test of time and technological changes, the professions have also provided their members with many personal intangibles such as security, status,fulfillment, belonging and mobility.

By contrast, the DPer who has performed in a capable manner can find himself stagnated simply because he does not possess the current expertise of the most current system. If you believe this appraisal to be untrue or unfair then read the position announcements section of a publication containing DP want ads. The really capable DPer who, with honesty and conviction retains his old equipment realizing he can use it to full capacity and potential for many years, at a lower cost to his company, has condemned himself to a status quo and has limited his potentials.

One of the many shortcomings of DP as a "profession" is that it is always seeking those who are proficient in the "now thing," whatever it may be. The responsibility for this disparity has to be borne on the shoulders of many who have forgotten true values and who constantly seek the satisfaction of ego.

In performing his job well, the DP man has to learn as much, if not more, than the top executive of his company. Yet he is not considered for top management jobs as a general rule. Professional status proponents will now say this fact is another reason for seeking the status, the reality of the situation is that we are in actuality becoming professionals of the fields we are serving.

We cannot become doctors or lawyers through the mere use of computers to serve such fields, but we can certainly become business executives, administrators, managers, designers, bankers, so that we really need to convey this message loud and clear rather than strive for DP professional status.

What about ethics and behavior? The recognized professions have had codes of ethics and behavior for a long time, yet they seem unable to enforce their codes to the extent that public confidence and trust are lacking toward them. One usually finds that whenever someone of any profession has violated honesty and integrity, he has done so with help or with apathy from others.

What is really needed is a general acceptance and practice of ethics throughout the business world. Dishonesty in any form should be intolerable.

What about certification? Already some of those holding the CDP are clamoring for the "Grand CDP" and eventually some of those would seek a "Grander CDP," until certification is the only real way of being a professional or being recognized as one. Let's face it, there are people in this world who have a capacity and capability for passing examinations who are incapable of performance in the same field for which they were examined.

No Common Ground

As DPers we find much difficulty in reaching common grounds. Consider the numbers, types and sizes of businesses and professions we serve and the fact that there is no standard as to manufacturer and computer size to serve them, and you can grasp one of the reasons why.

We also have difficulty in communicating with one another and our zest for the use of acronyms and abbreviations make their deciphering almost a full-time job. If many of the DPers who have become professional attendees of seminars, conventions, workshops or conferences spent as much time toward communication as they spend in this, we could probably start using plain old English again.

Then there is the much sought after standardization of software, which has not quite gotten there. Already microprogramming and the soft processor, which give a computer the ability to act as another computer and accept any other language, make the problem of standardization more academic and in effect will result in individuality for the user.

As more individuals of other fields of knowledge learn DP as an additional requirement and use it as a tool to aid them, as manufacturers, recognizing the true purpose of computers, make it easier for them to use, and as we refuse to accept our true role, DP will change in nature. The demands for DP people, which now appear to be very high, will dwindle to an insignificant number akin to the days of electromechanical machines.

Data processing is a subservient field of knoweldge, which emerged to satisfy the needs of the various professions for fast, accurate data manipulation that would aid them in making more expedient and more precise decisions toward solving their problems.

The data processor is an individual filling a technological gap – an individual with unique and often inherent talents and abilities who is capable of performing many functions. His true profession is that of servitude, and if his ego does not get the best of him he can attain unprecedented heights and recognition and even be a full fledged member of the profession he serves.

I'm not ashamed of accepting this role. Are you?

Willie Grafals is vice-president of The Farmers and Merchants Bank of Stuttgart, Stuttgart, Ark.

Alan Taylor is on vacation and will return next week.

Letters to the Editor

The following two letters were recently received by *Computerworld* in response to an advertisement.

Exploiting Women Sexually No Way to Sell Product...

I am writing in reference to the Layla ad which recently appeared [CW, Aug. 21, page 13]. I find the ad tasteless, insensitive, and highly offensive.

ECI Software Corp. (and/or its advertising personnel) should realize that there is a growing awareness among women which will not allow this kind of advertising (or the lack of thought that went into it) to continue. I am shocked to see there are firms like ECI who are so far behind the times that they will continue to sell their products on the basis of sexual exploitation.

I quote from the ad (which is obviously directed to male-dominated management): "Layla gets her man (or men) for you and every time ... [she's] flexible ... and among her other notable talents, she can schedule multiple projects ... and charge ... she's yours on ... lease or outright sales basis ... special features and vital statistics ..." ad nausem.

There are professional women all over the world in the DP industry who are outraged at the continued blatant offenses in their industry's trade publications.

I know that the industry is male-dominated and that males (as well as females) enjoy having their egos served. But not at the expense of any other person!

I'm sure CW would reject an ad for a product called Coon (Control of On-Line Nothingness) which showed a black servant at his master's beck and call. So should CW reject any ads which depict women in demeaning (i.e., Layla waiting for her man to call) or any other of their traditional, sex-stereotyped roles.

Women are not commodities. They are not for sale. They are not as flexible as they used to be. They do not sit by their phones waiting coyly for the next man to call. They are in professions and violently oppose the male ego-serving roles into which they have been (and continue to be) cast.

I hope this letter (and the others I'm sure ECI will be receiving) will serve to raise its social consciousness enough to consider discontinuing this presentation of Layla. I might have suggested another, nonsuggestive, nonexploitive approach for an advertising campaign, but the product name in itself leaves little to the imagination, other than what ECI has already done.

Unfortunately, after having chosen the product name, there was only one direction for the advertising to take.

Surely ECI could have come up with a catchy name, given itself more leeway in its advertising and possibly even sold a few systems without resorting to a policy which, in fact, is demeaning and morally unacceptable to over half the population.

Julie D. Wilson
Trenton, N.J.

... But They Didn't Mean To Direct Ad Just at Males

On behalf of ECI, I would like to extend our sincere apologies for having offended Julie Wilson in any way with our advertising campaign.

At this time I would like to take the opportunity to explain how we derived the name Layla for our resource scheduling system.

"Layla" is the title of a song which was popular during the time we were writing the program. The project leader felt this would be an appropriate title for the program.

Our advertising agency immediately saw the potential of the similiarity between the name Layla and the leader character Lola from the Broadway musical "Damned Yankees" and especially the application of the song title, "Whatever Lola Wants, Lola Gets," to our company system.

A great deal of thought went into the creation of our cartoon character so that sexual exploitation would *not* be a factor.

It may surprise Wilson to know that approximately 30% of the DP professionals responding to our ad campaign are women. In fact, in my 10 years experience in the DP field, women have always held respectable, equal, well-compensated positions side-by-side with men.

So you can see the ad was not meant to be directed to "male-dominated management."

Although Wilson's letter is the only such letter in the eight months of our ad campaign, we are not insensitive to the subject.

We found Wilson's comments profitable and are taking steps to alleviate any possible room for misrepresentation.

Peter E. Katsoulas
President
ECI Software Corp.
Needham Heights, Mass.

Goldwater Does Respond

While Bob Patrick is one of the leaders of our industry, I find I must take exception to a portion of his letter [CW, Aug. 14].

Rep. Barry Goldwater Jr. (R-Calif.) does acknowledge correspondence on his "Comprehensive Right to Privacy" bill (HR 15525). Not only did he acknowledge my comments, but he sent me a copy of the bill and asked for further comments.

Andrew H. Olson
Senior Technical Advisor
System Development Corp.
Paramus, N.J.

Cambridge Who?

Re the front page article Aug. 7 on 370 add-on memory suppliers: Is it true that Cambridge Memories has disappeared?

Last time I looked, Cambridge:

- Made core and semiconductor add-ons for System/370 models 145, 155 and 165.
- Had shipped more than 250M bytes of 370/Stor memory to those users.
- Was the only supplier in the market that designed, manufactured, sold and serviced all its 370 memories.
- Was ranked Number 1 in the add-on memory business in a recent study of computer user attitudes.

Kevin I. Dowd
National Sales Manager
Cambridge Memories, Inc.
Bedford, Mass.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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The cold facts about Microdata.

So far, you've only seen the tip of our iceberg. We think it's time you got a complete view of Microdata, the full-service computer company.

Microdata brings Reality to the computer industry.

Microdata recently introduced a new virtual-memory computer system called Reality™ – a low-cost distributive data base management system for real-time business applications.

We started by developing powerful new multi-programming system software and then designed the system architecture to support it. The ENGLISH™ language software makes Reality so easy to use, anybody who speaks ordinary English can operate it. The system is also fully compatible with RPG II.

Reality in more ways than one.

We believe having a good grasp on reality means knowing who you are, what you've got, and where you're going with it.

We've spent years telling people that a microprogrammable minicomputer will outperform any expensive general purpose machine on any given job. We've consistently supported microprogramming. And now it's paying off.

We've got over 6,000 minicomputers in the field, and we're breaking into diverse new markets every day. Our horizontal marketing base is expanding at an unprecedented rate, and the vertical integration of our manufacturing is virtually complete. In addition to our OEM minicomputers, we're now building a new series of miniperipherals, a new high-speed microprocessor, the complete Reality system, and our own printed circuit boards, core plane memories, and power supplies.

Strength in depth.

Recent developments have accelerated our evolution. We're doubling our plant size, establishing a coast-to-coast dealer organization for Reality, setting up a nationwide network of sales representatives for peripheral products, strengthening our direct sales force, expanding our national customer service force, increasing what is already the world's most experienced staff of microprogramming experts, and adding several key executives to our corporate management.

You still don't know enough.

We know who we are, what we've got, and where we're going with it. We always have. If we look new to you now, perhaps it's because you didn't know enough about us in the first place. We'll be happy to tell you anything else you'd like to know.

If you're looking for a supplier of minicomputers, peripherals or computer systems, see the company that offers more than meets the eye.

See Microdata.

Microdata

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Data Base, Communications Topics

Program Promises Abundant Management Sessions

NEW YORK – Info '74, which promises a program on DP management and technology "designed for the man who can't tell a bit from a byte" while still including a high level of technology for the attending DP manager, will offer 10 different sessions on this topic Monday through Wednesday.

"Management and the EDP Manager" will be covered Monday morning and topics will include "Bridging the Gap Between EDP and Executive Management – What is the Problem," "Assuring the Effective Use of EDP – the Executive's Responsibilities" and "Guidelines for the EDP Manager in Enhancing the Effectiveness of His Function."

Three other major topics will be discussed concurrently. "Evaluation and Planning for Improved Configuration Performance" will include discussions entitled "Software and Hardware Monitors – An Evaluation of the Techniques for Measuring System Performance," "The Pros and Cons of 'Trading Up'" and "Evaluating and Planning Configurations for the Fourth Generation."

Data Bases Discussed

Another one of Monday morning's concurrent sessions will be concerned with data base management entitled "Acquiring a Data Base Management System." The session will feature "Analyzing User Needs for a Data Base Management System," "A Review of Current Data Base Management Capabilities" and "Selecting a Data Base Management System: a Methodology and a User's Experience."

A session dedicated to "Advanced Computer Techniques for Developing and Maintaining Business Data Processing Applications will be highlighted by papers on "New Techniques for Generating Cobol Programs from Systems Specifications," "New Techniques for Developing On-Line Systems" and "Advances in Developing and Maintaining Cobol Applications."

Monday afternoon, four more concurrent sessions will be presented on the topic of DP management.

A session devoted to "Managing the EDP Professional – Guidelines for EDP Managers" will feature "Career Paths for EDP Professionals and the Management of Advancement," "Training Programs for Improving the Capability of the EDP Staff" and "Measuring the Performance of the EDP Professional."

Another session will confront the future – "Future Considerations for Configuration Planning." "The Fourth Generation – a Forecast of the Systems of the Next Ten Years and Their Impact on the User" will be followed by "The Configuring of Multi-Minicomputer Systems and an Analysis of Their Future Potential vs. the Large Central Processor."

"Virtual Storage for the User" will be devoted to three topics – "The Value of Virtual Storage – It's Benefits and Costs," "Guidelines for Conversion to Virtual Storage," a case study, and "The Verification of Virtual Storage Performance."

Communications Consortium

Those interested in data communications might wish to attend the session entitled "Advances in Data Communications."

Among the topics to be covered are "Progress of the Specialized Carriers in Providing Data Transmission Services for Data Communications," "Effects of Advances in Design on Terminals/Computer Systems" and "Guidelines to Low-Cost Data Communications – Design Considerations in Light of Changing Technologies and Regulatory Policies."

Tuesday's sessions will begin with "The Management of Computer Programming Projects" covering "Programming Management – a Report on Current Experience with the Emerging Techniques," followed by "The Problems of Authority and Responsibility in Managing the Programming Project" and a case history entitled "Innovation in Project Control – Managing the Baseline."

A second session on data base management, entitled "Data Base Management: Concepts, Benefits, Costs, Methodology," will also be held Tuesday morning.

Presentations will include: "The Uses of a General Purpose Data Base Management System and Its Effectiveness as a Software Tool," "The Utility of Special Purpose Data Bases and the Software Tools Needed to Use Them" and "Distributed Data Base Systems – Their Feasibility and the Tools and Support Needed for Implementation."

Three sessions are scheduled for Tuesday afternoon. Dealing with "New Hardware and Software for Manufacturing Applications," this session will consider "On-Line Systems for Collecting and Disseminating Manufacturing Data," "Canned Software for Manufacturing Information Systems" and "Minicomputers for Production Management."

Info '74

Retailers Gather

Hardware for retailing applications will come under scrutiny in the second afternoon session. "Low-Cost OCR for Identifying Customer and Merchandise Data," "Technical and Economic Trends for Interactive Terminals" and "Futures for the Minicomputer in the Retail Organization" will be discussed.

Those interested in doing a better job with the communications resources they already have, might wish to attend the third afternoon session, entitled "The Effective Corporate Use of Current Data Communications Resources. The session will include such topics as "Developing Management and Operating Practices for a Data Communications Environment," "How to Manage a Successful Marriage of Computers and Communications" and "Planning a National Data Communications Network, A Case Study."

Wednesday morning, a session is scheduled entitled "New Information Sources for Business Decisions – Data Base Services." Among the topics to be presented are: "The Kinds of Data Bases Currently Available – Their Characteristics and Applications in Business," "Marketing and Financial Data Bases For Business Planning and Analysis – What's Available and How They are Used" and "The Emerging Industry of Data Base Services – What's For the Future."

"Managing the Security of Data Processing," also beginning in the morning, will include such topics as "Opportunities for Computer Abuse – Intentional Acts that Threaten the Corporate Enterprise," "The Protection of Vital Data – Techniques in Controlling Access to Computer Files," "Audits and Controls for EDP – A New Task for Management" and "The Planning and Implementation of a Secure EDP System."

"Computer Networks and Distributed Processing," the third of four concurrent sessions scheduled Wednesday morning, will include: "Distributed Processing for Information and Resource Sharing – Concepts, Potential and Economic Evaluation," "How the Advent of Networks Will Affect Terminal Features and Capabilities" and "Planning, Development and Implementation of a Computer Network for Distributed Processing."

Getting more out of data processing employees will be studied Wednesday afternoon.

Last on the list of management sessions is one to consider "Computer Program Verification and Reliability."

Executives Talk Micrographics

NEW YORK – Sessions on micrographic systems for storing, retrieving and managing records and automated systems leading to a paperless office may be of particular interest to administrative services executives attending Info '74 here on Monday.

Chaired by Robert F. Williams, president of Cohasset Associates, Inc. in Chicago, one session on micrographic systems will investigate methods for storing and retrieving records.

Another session dealing with micrographic systems as a means to records management will begin in the afternoon, with Richard Van Auken, director of Metropolitan Information Technology Center in New York, acting as chairman.

"Automated Office Systems: Stepping Stones to the Paperless Office" will explore the operating experience with independent telephone systems of RAK Associates in Cleveland, Ohio, Revlon, Inc.'s use of centralized dictating systems, and the information storage and retrieval system employed by the office management at the Wilson Jones Division of Swingline, Inc. in Chicago.

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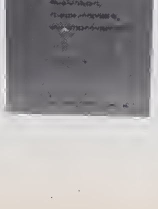
Order now by filling out the reply card and mailing it, along with a check for $15 per book, to Stimler Associates, 33 West Second Street, Moorestown, N.J. 08057.



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Sales Executives to Study Requirements

NEW YORK – John Bury of Purolator, Inc. in Rahway, N.J., and K. William Fraser Jr. of Fieldcrest Mills, Inc. in Eden, N.C., will chair Info '74's general session here on Tuesday for executives involved in marketing and sales.

Following this discussion of the need for marketing/sales personnel to take part in devising company information systems, a session on "How Sales Managers are Using Computers" will be held.

Led by Kimball Nedved, senior manager for the H.J. Heinz Co.'s MK information services in Pittsburgh, Pa., this meeting will deal with "Preparing the Sales Forecast From Data Provided by the Sales Force," "Analyzing Sales Data in Allocating Territories and Establishing Quotas" and "Comparing Sales Volume and Selling Costs When Monitoring the Sales Margin."

Also convening Tuesday afternoon will be a session on the use of the computer in market research. John Phillips of Creative Socio-Medics Corp. and Lester Fensterheim of Informa-Tab, both of New York, will lead this seminar on automating competitive analysis, allocating advertising resources and forecasting.

In addition to discussions of the data required, the modeling techniques used and the results that can be obtained, case studies will be used to illustrate the effectiveness of these techniques.

Meanwhile, "Marketing Information Systems in the Manufacturing Organization" will delve into the systems needed by these organizations for short-term sales forecasting, price management and market analysis.

Speakers will discuss data base requirements, systems used, techniques required and potential results.

Personnel Managers to Explore Advances in Federal Programs

NEW YORK – Sessions on information systems for federal programs and how personnel managers are using the computer in collective bargaining and other areas will make Wednesday "personnel day" here at Info '74.

Led by Conrad J. Lindemann of Information Science, Inc. in New York, N.Y., "Computer-Assisted Compliance -- Information Systems for Federal Programs" will explore automating the collection, processing and reporting of health and safety data to comply with OSHA.

In addition, the meeting will cover computer support for hiring minorities and women and for developing promotion systems to satisfy EEO regulations.

An afternoon session will examine advances in the application of computers to personnel information systems. As chairman, Glenn A. Bassett, consultant – employee relations with General Electric Co., will field questions on papers dealing with compensation and manpower planning and a review and evaluation of personnel management information system.

At the same time, the use of the computer in collective bargaining will be discussed in another session. Among the topics to be covered will be whether computer-assisted collective bargaining is reality or dream and how to automate search and analysis of labor union contracts.

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The session chairman, Monroe Morris of Pan American World Airways, Inc., New York, will deliver a paper on data bases and processing requirements for labor contract negotiation costing.

Service Sessions To Discuss Systems Tailored to 'Needs'

NEW YORK – Emphasizing information systems that are "needs driven" rather than "technology driven," Info '74's sessions on service organizations will be highlighted by a meeting of transportation executives here on Wednesday.

"Information Systems: A Task Top Transportation Executives Cannot Abdicate "will focus on the role of the corporate executive in managing his organization's information.

Chaired by Burce G. Curry, vice-president of management and systems science at the Hertz Corp., and James J. O'Neill, vice-president of management information and data processing with American Airlines, this session should provide a framework for executive thinking in developing and managing effective corporate information systems.

In addition to Monday meetings on implementing word processing systems, another Wednesday session plans to concentrate on "What Small Service Organizations Are Doing to Computerize Their Accounting."

Insurance Topics Cover Problem Areas

NEW YORK – Info '74's lineup for insurance users consists of four sessions each covering a major problem area.

A Wednesday morning session tackles the "Automation of Claims Systems in Group Health Insurance." In this session, a case history from Metropolitan Life Insurance Co. will be presented as well as papers on "Automated Claims Control: A By-Product of Automated Claims Payment" and a review of the "Impact of Automated Claims Payment Systems on Operating Costs."

Presented concurrently with that session will be "Measuring Profit of Insurance Company Operations," which will cover "Generally Accepted Accounting Principles in Life Insurance Companies: a Prerequisite to Automated P&L Reporting," "A Product Cost Accounting in Insurance Company Operations: a First Step in Merchandising Profitability Reporting" and "Using the Computer to Support the Investment Function in an Insurance Company."

A Wednesday afternoon session will zero in on the computer-aided selling of insurance. This session will emphasize the "Opportunities for Real-Time Selling of Insurance: What Can be Done (the Benefits and the Costs)."

The last session, also Wednesday afternoon, will cover "Automated Claims Systems in Casualty Insurance."

coming up in
Computerworld

	Date	*Ad Close*
Data Entry	Oct. 30	Oct. 11
Computers in Retailing	Nov. 27	Nov. 8
Year-End Review and Forecast	Dec. 25/ Jan. 1	Dec. 6

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COMPUTERWORLD

Electronic Funds Transfer on Bankers' Agenda

Retailers to Focus on Merchandising Management

NEW YORK – Retailers attending Info '74 get down to cases Tuesday morning with a choice of an executive session or three concurrent sessions including presentation of 10 individual papers. Sessions for bankers begin on Wednesday.

The early retail sessions will focus on "Information Systems in Distribution and Shipping," "What Small Retailers are Doing to Computerize Their Accounting" and Part I of Information Systems in Merchandising Management."

Papers on "Tracking the Movement of Goods" and a case history of an "Automated Warehouse" will highlight the session for shippers and distributors, while studies on payroll, accounts payable and accounts receivable are designed to aid the user attending the small retailers session.

"Information Systems for Merchandising Management" (Part II) takes place Tuesday afternoon along with two other sessions – one on new computer hardware for retail applications and data communication resources and a seminar on using the computer in market research.

The merchandising management sessions will discuss whether the subject can be automated, the components and structure of an integrated merchandising information system and – in the afternoon – a pair of case histories.

Wednesday's work for the retailer focuses on point-of-sale (POS) systems or on electronic fund transfer (EFT) – a subject area that ties in directly with the sessions for bankers. The POS session features a case history and analysis of the "before" and "after" in the installation of a POS system.

EFT is just one of the topical areas bankers can attend on Wednesday. In the morning they have a choice of an executive session covering the basic problems of information systems in their environment, or three concurrent sessions.

Part 1 of "EFT – A Practical Goal?" includes a progress report on EFT systems and commercial banks; "The Prospects for EFT – Technical Feasibility, Problems and Costs" and the "Economic Impact of EFT."

Other sessions that morning include a study of data base services, with three separate papers; and "Managing the Security of Data Processing," with another four papers.

Info '74

Wednesday afternoon, the second part of "EFT – A Practical Goal?" reviews progress within thrift institutions, "The Prospects for EFT – Policy Issues" and the "Social Impact of EFT."

Bankers still uninvolved with EFT can attend a session with four papers focusing on a "Financial Information System for a Diversified Business."

Thursday morning, bankers are offered a collection of six papers, spread over two subject areas: integrated information systems for bank operations and automated planning for bank management. Central information files are the subject of two papers in the first area, which also includes a case history in the evaluation of an integrated information system for banking services.

Thursday afternoon is the bankers' opportunity to consider how small institutions use computers. This session features a survey of what equipment is being used, a paper on the use of time-sharing facilities and another on the applications, operating trade-offs and economics a bank must consider.

Government Users Review Problems

NEW YORK – Thursday at Info '74 will be a busy day for users interested in problems and approaches in government data processing.

One morning session and one afternoon session form a matched pair emphasizing "Information Systems in State and Municipal governments." The first session covers "What the Jurisdictions Are Doing" and the second part concentrates on "Planning and Scheduling."

Papers in the first session include: "Information Systems in State and Local Jurisdiction – A Survey," "Revenue Collection and Accounting – Information Systems for Taxes and Services," "Accounting and Financial Systems for a Analyzing Transactions (vs. Budget) and Forecasting Revenue and Cash Flow" and "The Impact of the New Federalism on Municipal Systems."

Papers scheduled for presentation in the second session include "Process Control Systems in Municipal Government," "Allocation and Scheduling of Resources for Refuse and Garbage Collection," Information Requirements for the Management of Solid Waste Disposal" and "The Use of Land Use Data in Analyzing Trends and Evaluating Proposals for Land Use."

A Thursday morning session of topical interest will cover "Information Processing for Law Enforcement."

Papers at this session are: "Cost Effective Applications for Computers in the Administration, Operations and Planning of Police Departments," "The Allocation and Scheduling of Resources for Police Patrols and Shifts," "Collection, Storage and Retrieval of Records for Police Investigations" and a report on the "Current Status of the National (NCIC), State and Regional Information Systems for Law Enforcement."

Two other specialized areas will be featured Thursday afternoon. One session will investigate "Information Systems for Health and Welfare Administration" with papers on "The Role of Jurisdictional Administrators in Developing Management and Payment Systems for Public Assistance," and "An Information System for Managing and Distributing Welfare Payments."

The last session covers "Information Systems for Emergency Services of Local Governments" with papers on "A State-of-the-Art Report on the Information Systems to Support Emergency Medical Treatment," "The Jacksonville Emergency System: Information/Communications in Action," and "A Report on Information Systems to Support Firefighting and Rescue, and Guidelines for Developing Them."

Untouched by Human Hands?

A report on Computers in Manufacturing in the September 25th issue of *Computerworld*.

This Special Report will look at two different aspects of computers in manufacturing: Management Information Systems and computer-managed manufacturing. We'll be covering topics like these:

- Advantages of MIS to a manufacturing firm
- The implementation of an MIS–case study of user experiences
- Trends in computer-managed manufacturing, how will it affect business side of data processing?
- Worker satisfaction and the automated factory
- Computers and "smart" production machines
- Materials Requirements Planning—what it is and what it can do

COMPUTERWORLD

Manufacturing Sessions to Stress Guides for Small System Users

Info '74

NEW YORK – Heavy emphasis will be placed on DP in the manufacturing environment with eight sessions directly dealing with the subject during Info '74 here this week.

In particular, the sessions will highlight what smaller manufacturers are doing with DP and how smaller systems can be tailored to manufacturing applications, a glance at the program shows.

The first session devoted strictly to manufacturing will take place Tuesday with a look at "What Small Manufacturers Are Doing to Computerize Their Accounting," chaired by Robert A.Weber, president of Ultimacc Systems, Inc.

Papers scheduled for the session include "Accounting Applications for Small Computers – What Should Be Automated and When?", "Guidelines for Systems Design – Deciding on What's Needed and Preparing Specifications," "Cost Analysis System on a Small Computer That Provides Labor and Material Reports on Finished Jobs and Works in Progress" and "The Alternatives for Automating – Own Computer, On-Line Service, or Service Bureau."

That morning there is also a session on "Information Systems for Manufacturing Management," including papers on "The Components and Structure of an Integrated Manufacturing Information System," "The Design and Development of the Data Base for a Manufacturing Information System" and "Computer Implementation of a Manufacturing Information System and an Analysis of the Benefits."

'Process Manufacturing'

Tuesday will also see a session on "The Management of Information in Process Manufacturing," under the direction of Allan H. Albert from Celanese.

The three papers scheduled for this session incude "The Commonality of Information Functions in Process Manufacturing," "A Hierarchical System for Collecting Data in Process Manufacturing" and "An Approach to Managing Information in Process Manufacturing."

Also on Tuesday morning there will be a session on "Information Systems in Distribution and Shipping," including papers on order processing and inventory management as well as the tracking of goods and a discussion of the possibility of automated warehouses.

Tuesday afternoon will feature sessions on such topics as "Managing Production on a Small Computer," including papers on scheduling, job cost monitoring and inventory management on small systems.

Another session that afternoon will discuss ways of "Using the Computer to Cut Manufacturing Costs," with such papers as "The Future Potential for Computerized Management Science Techniques in Manufacturing Management," "Computer Simulation to Balance Multiproduct Assembly Lines," "Scheduling the Work Force to Minimize Aggregate Manufacturing Cost" and "Computer Methods for Locating Manufacturing and Warehousing Sites."

There will also be a session on "New Hardware and Software for Manufacturing Applications" on Tuesday, including papers on on-line systems, packaged software for manufacturing and minicomputers for the production environment.

The final session on Tuesday will feature papers dealing with "Information Systems for Industrial Automation."

Medics Gather for 'Hospital Day'

NEW YORK – Thursday will be "hospital day" at Info '74 with a two-part, full-day session dealing with "Information Processing in the Hospital."

The morning half of the hospital DP session will cover such topics as "What Computer Applications Are Paying Off in Hospitals," "Planning for Hospital Data Processing – Guidelines for the Administrator," "A Cost Reporting System for Hospital Administrators" and "An Alternative for Hospital Automation – The Service Bureau Cooperative."

The afternoon part of that session will cover "Model for a Medical Records Data Base" with an example in casebook form of a hospital that has fully automated its information system.

In addition to the session on hospital automation implementation, there will be two other sessions for the medical community on Thursday.

One will deal with Professional Service Review Organizations (PSRDs) and the information systems support they will need as they come on-line.

Papers scheduled for this session include "The Impact of PSROs on the Organization and Its Information Systems in Teaching Hospitals" and "Peer Review and the Related Information Systems as an Answer to PSROs."

The other session on Thursday will cover "Automating Planning in Hospital Administration: Requirements, Forecasting, Personnel Scheduling, Facilities Allocation, Rate Analysis."

Financiers Review Duties

NEW YORK – Info '74 sessions designed for those in finance will begin here on Wednesday with a general discussion examining why the financial executive can't afford to abdicate his responsibility for his firm's information systems.

This session will be followed by an afternoon meeting on financial information systems for diversified businesses.

Finally, a paper on "The Financial Information System – A Total System for Management Decision Making" will be presented.

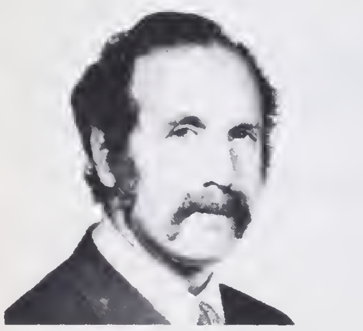
If you're interested in a practical approach to the design and implementation of data base systems, we have a seminar for you.

Data Base Systems can be very effective EDP tools. But they can also be a waste of computer time and memory. The difference lies in effective planning, system selection and management. And this course will give you both the information and the basic experience you need for proper design and implementation of a data base system.

Course topics include all aspects of Data Base Management.
Here are some of the subjects to be covered in this comprehensive seminar:
- The description and definition of the Data Base System Project
- The development of a full-service analysis and system design
- The criteria for record design and distribution.
- Optimum file organization and indexing techniques.
- The problems of data assurance and the techniques for resolving them.
- Design layout and formal implementation specifications for the data base system.
- All available indexing techniques and their applications.
- Implementation techniques for efficiency in system performance.
- All aspects of system management
- The role of the Data Base management packages.

Workshops let you learn by doing.
Doing is the best way of learning And before you're finished Data Base Management you'll have "done" a complete, on-line order/entry inventory management system. You'll accomplish this in four workshops, which follow instructional sessions in each segment of the course. So you'll get the information you need, then sit right down and apply it. It's a technique that has proven to be very effective, and it's an integral part of this seminar

Seminar created by Leo J. Cohen and staff of Performance Development Corporation.



We selected this seminar for inclusion in the EDP Seminar Series after watching it in action.
It was developed by Performance Development Corporation under the direction of its President, Leo J. Cohen, a nationally known consultant in data base systems. Mr. Cohen will continue as seminar director, and the seminar leaders are PDC staff who are experts in their own right They include Alan Stutz and Steve Robinson, both of whom are well-known for their work in this area. All instructional staff have been involved in design and implementation of a variety of data base systems for major U.S. computer-using organizations.

Who should attend.
If you're going to be involved in the design and implementation of a data base system – whether as the DP Manager. Data Base Administrator, planner, analyst or programmer – then you should be at this seminar. It will help your department, your company and you!

Schedule and Costs
We'll be offering this seminar in the following cities during the latter part of 1974. Charge for entire 3-day seminar, including course materials, continental breakfasts and luncheons is $350. Additional registrants from the same company get a reduced rate of $300. Fees do not include hotel rooms if necessary, but we have reserved space for attendees who desire rooms. Remember, enrollment is limited!

October 14 - 16	Boston	Parker House
November 18 - 20	Chicago	Playboy Club
December 9 - 11	Denver	Cosmopolitan

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Random Notes

ISML Issues Fourth Edition Of Fortran Routine Library

HOUSTON – Edition 4 of the Fortran subroutine libraries from International Mathematical and Statistical Libraries, Inc. (IMSL) will include more than 80 new routines, in addition to enhancements in the 300 routines from previous editions, the vendor said.

To be delivered in October, Edition 4 will add a sampling chapter, numerical integration routines, eigenvalue subroutines, forecasting routines and a new random number generator. The libraries lease for $960/yr from ISML at Suite 510, 6200 Hillcroft, 77036.

Data Base Service in Dallas

DALLAS – Users in the Dallas-Ft. Worth area can access the power of a Burroughs B2500 and a Codasyl-compatible data base management system, for a cost "competitive with in-house minicomputer systems," under a service plan offered by Paden Data Systems, Inc.

Paden charges a monthly storage fee for the data base with minimums covering the cost of terminals at the user site. Custom application programming support is provided by Paden's staff, a spokesman for the firm said from 5838 Live Oak, 75214.

'Retrace' Debugs BAL Programs

TROY, N.Y. – OS/360-370 users can debug BAL programs by using the Retrace package from RRC International, Inc. to generate a printed history of instruction flow over a period of execution time, plus lists of register and specified storage area contents both before and after execution.

Retrace can be used to debug programs running under a CICS environment and it isn't necessary to reassemble a program to use the debugger, the firm noted. The package increases the user's existing load modules by 12K to 20K. The $20,000 purchase price includes source and object code, RRC said from 1125 Peoples Ave., 12181.

TSO-Panvalet Linkage Enhanced

OAK BROOK, Ill. – An updated TSO Command Processor (Version M) to interface with the enhanced Panvalet Version 8 is now available for Pansophic Systems, Inc. Basically, the new TSO support will allow greater library management flexibility, a vendor spokesman said.

User exits, a "TSO" operand for the Add, Retrieve and Store functions, and a "NOEXPAND" operand for the Retrieve function are among the enhancements included under the updated TSO command processor, which may be purchased for $3,000 or leased for $300/mo, from 1301 W. 22nd St., 60521.

DOS/VS Problems, Solutions Sought

By Don Leavitt
Of the CW Staff

CHERRY HILL, N.J. – DOS/VS users may be able to help others as well as themselves by taking part in an essay contest sponsored by Value Computing, Inc. (VCI).

Prize for the best paper will be $250, which may be enough by itself, hoped VCI president Vince Bannan, "to encourage computer operations management in DOS/VS environments to share their problems and hopefully contribute to the eventual solution of some of the most pressing" problems.

The contest is open to anyone in the computer operations area, according to Bannan, including consultants or people in direct-line operations functions. Submitted essays should clearly define a "significant" operations problem in utilizing the IBM DOS/VS system.

The problem covered by an essay may range across such areas as operator interface, tape handling, console message printouts, excessive paging or thrashing, program deactivation or performance information (or the lack of it). The important thing, as far as the company is concerned, is to get a good interchange of ideas.

Under rules of the contest, published originally in VCI's August newsletter, each author should submit an original write-up, typed, single-spaced on 8-1/2 in. x 11 in. paper describing in detail the specifics of a DOS/VS problem. The essay must have a minimum of 1,500 words.

Contestants are urged to include a brief "environment paragraph" indicating the hardware, software (by release number), type of shop, makeup of the workload in percentages by operating mode, and number of job/day.

But judges "will be mainly interested in the specifics of the problem, clarity of the exposition and the degree to which the problem significantly affects computer center efficiency," the rules added.

They also included the usual phrases that the decision of the judges "shall be final" and "this contest is not applicable in states where it is illegal."

The deadline for entries was originally Sept. 15, but VCI has moved that date back a full month to stimulate those who may not have seen the first announcement of the contest. Essayists need not be VCI customers, Bannan reiterated.

He added that the results of the contest, in defining problems or locating solutions, will not be kept to the VCI user base. "While 'there's no point in reinventing the wheel' is a trite phrase, it is still true," he said, summing up.

Essays should be submitted to VCI at 496 Kings Highway N., 08034.

Introduction of RPG-II Extends Potential Datapoint 2200 Uses

SAN ANTONIO, Texas – It's becoming harder and harder for today's Datapoint 2200 users to say whether they have intelligent terminals or stand-alone systems. And the problem has just been compounded by Datapoint Corp.'s release of the RPG-II business language, as well as new versions of Datashare III and Dataform.

Datapoint's RPG-II is industry-compatible with only minor modifications in areas such as file descriptions required before specifications written for another machine can be used on the 2200.

Development of an indexed sequential access method (Isam) has been a vital factor in development of this language system, the company noted.

Isam makes extended record lengths possible and file operations simpler and faster, a spokesman explained.

Datashare is a multiuser, multijob facility that allows up to eight video display terminals to be linked to a single 2200. Each user can run separate programs and access separate files under this scheme.

In addition to Isam support, the new version of Datashare III includes variable partitioning, an enhanced arithmetic package and support for more flexible printer use than has been available previously.

Dataform is a data entry language that aids in the development of CRT screen layouts for different applications. The new disk-based version is said to reduce by 60% the time required to set up an application.

Supporting these major packages, Datapoint also announced a preprocessor that permits users to type RPG-II programs directly on a 2200 keyboard.

Datapoint is at 9725 Datapoint Drive, 78284.

JCL 'Docu-Gen' Aids Disk Shifts

LOS ANGELES – Preparation of job control language (JCL) statements has been made even easier for the OS/360-370 users with an enhanced version of the JCL Docu-Gen package available from Compumail for $1/day.

Intended primarily as a tool for easing JCL preparation, JCL Docu-Gen also creates system flowcharts and job descriptions for all job steps and reports for both management and staff. It has sort and other utility functions, the vendor added.

Enhancements include support for more default options. All of these are now contained in a single control area and can be changed at any time without modifications programmed by the user.

JCL Docu-Gen has the capability of regenerating all of the user's procedure library with a single control card. This is particularly useful in system conversions, since it allows, for example, immediate replacement of references to 2314 disks with references to 3330s, Compumail said.

The system logic has been revised so that the program now operates in 80K instead of 120K of main memory. Even though this is a 33% saving in core, it does not entail any offsetting increase in process time, a spokesman noted.

Although not a technical change in the program, the shift to the $1/day lease arrangement is seen by the vendor as a real enhancement, since it may make the package available to users who could not cost-justify the older $1,000 version.

JCL Docu-Gen operates under OS or OS/VS, the vendor added from 1951 Malcolm Ave., 90025.

T/DOS-11 Links Cartrifile, DEC Minis

MOUNTAIN VIEW, Calif. – Tri-Data Corp. now has a Tape/Disk Operating System (T/DOS-11) to interface its Cartrifile 211 magnetic tape unit and Flexifile 52 floppy disk system with Digital Equipment Corp. (DEC) PDP-11 minicomputers.

The executive contains I/O logic, system tables and the nucleus of error handling and the start of file Open/Close routines. The keyboard monitor and overlay are disk-resident and brought into core only as needed. The overlay handles most device errors, command string decoding, and file opening and closing.

T/DOS-11 includes support for contiguous file structures, with a device packing routine; 'quick run slots,' which initiate program loading under control of a core-based rather than a disk directory; and core image files.

T/DOS-11 has support modules including a system generation program, text editor, linking assembler, linker, on-line debugging package, peripheral interchange program and the device packing routine.

The basic T/DOS-11 requires a DEC PDP-11 with at least 8K words of memory, a Cartrifile 211 or Flexifile 52 and a Teletype or TTY-compatible terminal.

The operating system is available for $1,100 from 800 Maude Ave., 94040.

MMS General Ledger gives Polaroid fast, accurate financial reports.

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Now... mainframe architecture in a remote communications processor!

COPE® 1600 by HARRIS

The COPE 1600 is *all new,* from its mainframe architecture and communications-oriented design to its built-in capacity for growth. This enables you to start with a basic RBT and expand as your volume and applications increase. All in all, COPE 1600 is your best way to achieve cost-effective communications!

What do we mean by cost effective? Read on. The minimum COPE 1600 system is a high-performance RBT in the COPE tradition. Then through expansion you can operate 16 asynchronous circuits concurrent with HASP/multileaving at 9600 bps with *no degradation.* Asynchronous speeds are available from 75 to 9600 bps. The 1600 will also operate up to 4 synchronous communications interfaces from 2000 to 50K bps.

Wondering about operational flexibility? Compare these features. The 1600 incorporates a multi-task communications operating system enabling you to control up to 16 concurrent program operations. The initial system accommodates five different emulators: HASP/multileaving, 3780, 2780, 1004 and 200UT. These emulators can communicate concurrently with two mainframes (of different protocols if desired). IBM SDLC hardware is built-in to accommodate future requirements.

Want to know more about the 1600? Then consider these advantages: expandable memory from 16K to 65K in 8K byte modules. Direct memory addressing. Comprehensive repertoire of 104 instructions. Structured programming language. Plus, there's a full complement of peripherals, of course, including magnetic tape and disk. And back-up support nationally by Harris' own Field Engineering Department.

That's only part of the COPE 1600 story. For more details on how you can 1) eliminate redundant system hardware, 2) reduce line costs, and 3) improve your overall network performance call your nearest Harris office. Or contact Harris Corporation, Data Communications Division, 11262 Indian Trail, Dallas, Texas 75234, (214) 241-0551.

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HARRIS CORPORATION Data Communications Division

On CSC's Infonet

FPS Backs Flexible Business Simulation

EL. SEGUNDO, Calif. – Company officers can get help in evaluating short- and long-term business decisions and plans with the Financial Planning Simulator (FPS) service now available on the Infonet remote computing network.

Described as a generalized tool for use in practically any financial modeling environment, FPS is broader in scope and easier to use than other, similar-sounding services, according to Computer Sciences Corp. (CSC), the Infonet vendor.

For its data-gathering and report-writing functions, FPS utilizes a matrix with a capacity of "more than 40,000 items," a spokesman said.

FPS has a modular construction and includes four subsystems providing control, logic, data and report procedures.

Single- or multipurpose problems, with one-pass or more comprehensive solutions, can be handled equally well, the network said.

Control Module

The control module is the executive processor which directs both data flow and analysis procedures. Control can be used to select information from multiple data files or to create new files to be used and processed by other models.

The logic module contains all directives related to the mathematics of the financial plan. Access to predefined routines for many conventional computations and to Fortran V for own-coding eases development of the models.

All data required by the planning model is entered through the data module, which accepts any of three format modes to facilitate data entry, screening and verification.

The report module is used to control the data items and time periods which are used in analysis reports. This module can access multiple data files and produce as many output reports as required, Infonet noted.

By subdividing the components of the modeling procedure, FPS allows the user to hold most elements of a financial plan constant while varying individual parameters to determine the effect of such detailed changes.

FPS was developed by Rio Tinto North American Services Ltd. in Canada, an Infonet source added from 650 N. Sepulveda Blvd., 90245.

Mailing List Support Runs on Basic/Four

GLENDALE, Calif. – Users of the Basic/Four small business system can run mailing list operations on their machines with a package of individual programs from Jesus to the Communist World, Inc.

For clerks untrained in DP, the central program edits data being entered and maintains the user files.

Output includes a master list of all records arranged in Zip Code sequence and alphabetically within the Zip Code.

Receipts for amounts received, or invoices, can also be typed, the vendor said.

At the end of the day the system totals all receipts and prepares a bank deposit slip. It also generates an income ledger evaluated by category.

A program that writes book invoices calculates all necessary taxes, postage and other charges. A subroutine "is in existence," the vendor added, for updating outstanding accounts when paid, including the processing of partial payments.

This program also includes the bank deposit slips for the receipts.

An expense ledger program is said to be capable of handling eight different bank accounts. This program also supports payroll operations including registers and check writing.

Another program in this package handles reorganization of data files, splitting them as they exceed predefined limits or reorganizing them to meet changes in the user's needs.

The program can also merge small separate files into one larger one, a spokesman said.

The largest of the programs in the package can run in a 16K user area, he added, and the entire package is available for $2,500 from Jesus to the Communist World, Box 11, 91209.

'Super/Doc': More Than a Flowcharter

N. HOLLYWOOD, Calif. – IBM 360-370 users can generate flowcharts and a miscellany of other documents from Cobol source decks used as input to the Super/Doc package from Occidental Computer Systems, Inc. (OCS).

The package can generate 10 different outputs with the choice left to the user at execution time. The heart of the system is the flowcharting options, but even they come in two variations: one showing internal program steps, the second showing basic logic paths and I/O used.

Super/Doc also can produce program cover pages, source lists with generated sequence numbers or error lists indicating syntax errors.

With OCS added, record layouts, cross reference lists or report layouts detailing field positions, column headings and other labels can be generated.

Super/Doc is written in Cobol but object modules are provided. The package is available for $2,950 from OCS at 11311 Camarillo St., 91602.

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VCI is one of the leading proprietary software developers in the United States. Its systems are exclusively designed to improve computer operations effectiveness, and have been providing a broad range of benefits to hundreds of IBM, Univac and Honeywell clients worldwide. Our users include many of *Fortune's* top companies, in banking, insurance, retailing, and manufacturing, and in the government.

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- ☐ TULSA, OKLA. Thursday, Sept. 12
- ☐ ST. LOUIS, MO. Tuesday, Sept. 17
- ☐ INDIANAPOLIS, IND. Thursday, Sept. 19
- ☐ DENVER, COLO. Tuesday, Sept. 24
- ☐ HARTFORD, CONN. Tuesday, Sept. 24
- ☐ OMAHA, NEB. Thursday, Sept. 26
- ☐ TORONTO, CANADA Monday, Sept. 30
- ☐ CHICAGO, ILL. Tuesday, Oct. 1
- ☐ DAYTON, OHIO Tuesday, Oct. 1
- ☐ OTTAWA, CANADA Wednesday, Oct. 2
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- ☐ MINNEAPOLIS, MINN. Tuesday, Oct. 15
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- ☐ ALBANY, N.Y. Thursday, Oct. 17
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- ☐ SADDLEBROOK, N.J. Thursday, Oct. 24
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Register Contents at Entry to Abend 'Not Preferred' for Debugging Work

By Lewis L. Copley Jr.

Special to Computerworld

Concepts and Techniques

Harmon Feig should be lauded for his effort [CW, Aug. 7] to educate those who, from time to time, find themselves debugging OS/360-370 system interrupts involving Open, Close and End of Volume (EDV) routines.

I am compelled, however, to take exception with his choice of registers – i.e., "registers at entry to Abend processing." To the novice, Feig's presentation would seem to be universal in application to the various OS/360-370 control program configurations available.

This is not the case, as can be seen by examining his attached Figure 1; his presentation is confined to Primary Control Program (PCP) and/or Multiprogramming, Fixed Number, of Tasks (MET). The Multiprogramming, Variable Number of Tasks (MVT) user is left out in the cold.

The registers at entry to Abend are not the preferred registers to use when attempting to debug OS-detected interrupts involving Open, Close and EOV. The analyst who places his trust in these registers as being valid predictors can be compared to the individual who unabashedly trusts the weather forecast. To be sure, the weather forecast often proves to be accurate; it also often proves to be inaccurate.

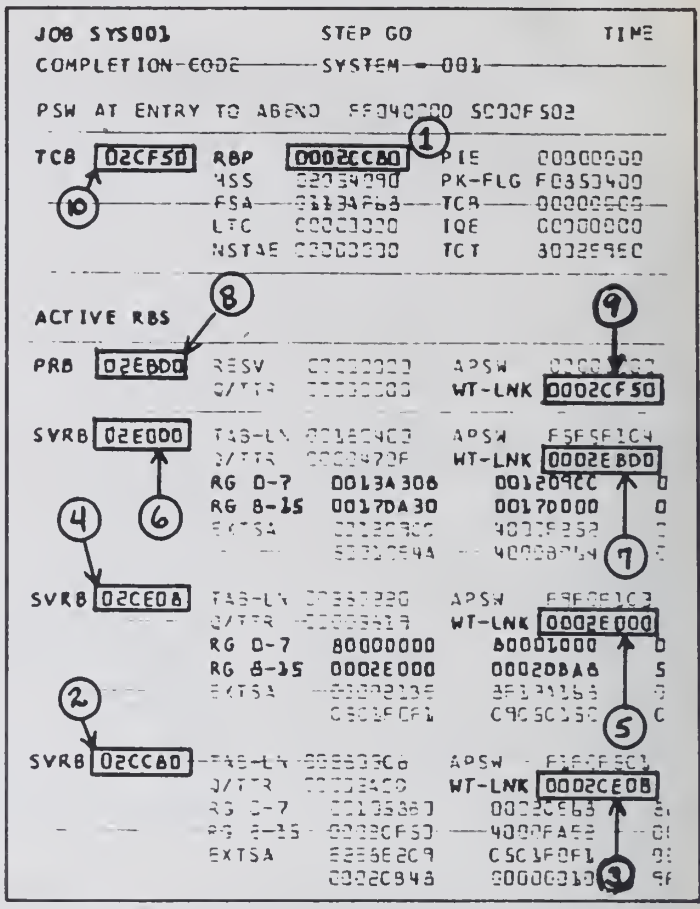
The fact that the methods provided by Feig work "in most cases . . . with success" can be attributed to two factors:

- His configuration.
- Extreme good fortune.

Well then, does a valid set of registers exist? Surely!

Problem program requests for supervisor resources such as Open, Close and EOV are invoked via the appropriate Supervisor Call (SVC) instruction. Because these resources are not immediately available, the problem program load module is interrupted, and the requested supervisor load module is chained to the problem program load module by establishing the Task Control Block Request Block Pointer (TCB-RBP) to indicate the address of the appropriate Supervisor Request Block (SVRB).

Once the task dispatching routines return control, execution of the requested supervisor service is begun because the TCB now points to the enqueued SVRB rather than the Program Request Block (PRB). For the duration of their execution, these RBs are maintained in the Active RB queue.


①
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```
JOB SYS001                    STEP GO                        TIME
COMPLETION-CODE        SYSTEM = 001
PSW AT ENTRY TO ABEND   FF040000 5000F502
TCB 02CF50   RBP    0002CC80    PIE     00000000
             MSS    02034090    PK-FLG  F0850400
             FSA    0013AF68    TCB     00000000
             LTC    00000000    IQE     00000000
             NSTAE  00000000    TCT     0002595C
ACTIVE RBS
PRB  02EBD0  RESV   00000000    APSW    [illegible]
             Q/TTR  00000000    WT-LNK  0002CF50
SVRB 02E000  TAB-LN [illegible] APSW    F5F5F1C4
             Q/TTR  [illegible] WT-LNK  0002EBD0
             RG 0-7   0013A308          001209CC
             RG 8-15  0017DA30          00170000
             EXTSA    [illegible]       [illegible]
                      [illegible]       [illegible]
SVRB 02CE08  TAB-LN [illegible] APSW    [illegible]
             Q/TTR  [illegible] WT-LNK  0002E000
             RG 0-7   80000000          80001000
             RG 8-15  0002E000          00020BA8
             EXTSA    [illegible]       [illegible]
                      [illegible]       [illegible]
SVRB 02CC80  TAB-LN [illegible] APSW    [illegible]
             Q/TTR  [illegible] WT-LNK  0002CE08
             RG 0-7   [illegible]       [illegible]
             RG 8-15  [illegible]       [illegible]
             EXTSA    [illegible]       [illegible]
                      [illegible]       [illegible]
```

Figure 1. The hierarchical relationship between the TCB and the Active RBs, as well as the relationship between the RBs on the queue itself, is seen by tracing the numbered chain on this dump printout.

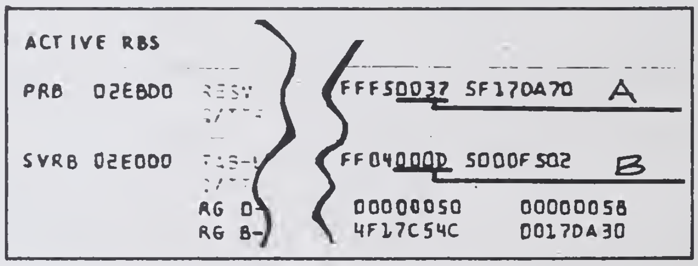
The contents of the TCB and Active RB queue can be easily located on Page 1 of an OS/360-370 dump (PCP/MFT/MVT). The relationship that exists between the TCB and the Active RB queue, as well as the relationship between the RBs (SVRB and PRB), is illustrated in Figure 1, steps one through 10.

Basically, two events can occur during the execution of a called load module:

- The load module completes all of its required processing, in which case its associated RB is dequeued and the TCB-RBP is changed to indicate the previous (calling) load module's RB.
- The called load module makes a request of a system resource provided by another load module, in which case another hierarchical level is established in the Active RB queue.

The reason an RB has given up control can also be easily determined by inspecting the Active RB queue. The control block that provides the analyst with

(Continued on Page 27)



```
ACTIVE RBS
PRB   02EBD0   RESV     FFF50037 5F170A70
SVRB  02E000            FF04000D 5000F502
               RG 0-    00000050      00000058
               RG 8-    4F17C54C      0017DA30
```

Figure 2. The analyst can determine why an RB has given up or lost control by interrogating the PSW interruption code for that RB.

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(Continued from Page 26)

this information is the Program Status Word (PSW).

The PSW for an RB in the active queue can be easily located in the Active RBs shown on Page 1 of an OS/360-370 dump (PCP/MFT/MVT). By interrogating the interruption code in the PSW (Figure 2, A and B), the reason for relinquishing control can be established.

No Coincidence

Using figure 2, the PSW interruption code for the PRB is seen to be 0037. This hexadecimal value, when converted to decimal, yields 55. It is not by coincidence that 55 is the SVC number for the EOV routines. In the example cited, the PRB gave up control to the EOV load module, which is represented in the Active RBs by the first SVRB following the PRB.

Inspection of the EOV SVRB indicates it was interrupted by making a request of SVC 13 (000D in hexadecimal, converted to its decimal equivalent); SVC 13 is the Abend SVC. Therefore, it can be established that, while the problem program was executing, a request was made for services provided by EOV, and, during execution of the EOV routines, an error was detected that necessitated abnormal termination, which resulted in control being given to the Abend load module represented by the second SVRB in the Active RBS (Figure 2).

In another article, Copley will review why the contents of registers at entry to Abend are unsatisfactory for debugging and where users can find the register contents associated with Abending service.

Lewis Copley is a member of Prudential Insurance Co.'s South Central Home Office, Systems Education and Research staff.

Another Approach

James D. Liedtke, staff programmer at IBM, Thousand Oaks, Calif., passed along the following thoughts regarding Harmon Feigs method:

There is a simpler approach to debugging Open-Close-EOV abends than the technical method outlined by Feig.

If the Abend occurs in an OS/360-370 system at a Release 21 level (March 1972) or later, a problem determination message containing all pertinent data set information will appear preceding step termination messages.

Its format is:

IECnnn abend code-return code, jobname, stepname, ddname, unit address, serial number, dsname.

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Data Briefs

IBM 2250 Emulation Offered On Sanders 900 Display

NASHUA, N.H. – Sanders Associates has added firmware emulation of the IBM 2250 graphic display terminal to the Sanders Adds 900 graphic display system. But Sanders said its terminal can be used interactively with a remote mainframe, while the IBM 2250 operates only in local environments.

The user of the Adds 900/2250 emulation system can do hardware-controlled clipping, translating, scaling and rotating, a Sanders spokesman said.

The Sanders system is compatible with IBM's Graphic Subroutine Package, Sanders said, and software written for the Sanders system can run on IBM 2250s, the spokesman added.

The Adds 900/2250 emulation system, including a channel interface processor, a display processor, a 21 in. display, a photo pen and keyboard with 32 function keys and a communications link between the channel interface processor and the display processor, costs $145,000.

Deliveries start in October from the firm at Daniel Webster Highway S., 03060.

T-Comm Front End Supports POS Terminal Systems

BOHEMIA, N.Y. – Periphonics Corp. has brought out several software modules that allow its T-Comm 7 front-end processor to support retail point-of-sale (POS) terminal systems.

The modules permit the Periphonics front end to communicate with the data collection minicomputers used with Singer, Sweda, American Regitel and NCR POS terminal systems.

The Periphonics front end can be used with IBM, Burroughs and NCR mainframes, a spokesman said. It currently supports Periphonics' audio response systems plus terminals and printers from other manufacturers.

The software modules costs from $6,000-$10,000 from the firm at 75 Orville Drive, 11716.

Mini-View CRT Includes Full Ascii Keyboard

TORRANCE, Calif. – Randal Data Systems has brought out an asynchronous CRT terminal with full Ascii keyboard.

The Mini-View offers protected fields, cursor keyboard control, cursor address, cursor readout, tabbing, protect and blink features and a programmable read function, according to the firm. All characters are displayed in upper case.

Transmission can be up to 9,600 bit/sec, the company said.

The Mini-View costs $1,695 or leases at $65/mo, including maintenance, from the firm at 2807F Oregon Court, 90503.

For On-Line Satellite Processing

Stock Net Relies on Concentrators, TDMs

By Albert J. Seedman
Special to Computerworld

Choosing between concentrators and time-division multiplexers (TDMs) was just one of the questions Bunker Ramo Corp.'s Information Systems Division faced in designing and implementing two separate large-scale on-line stock quotation networks recently.

The National Associaition of Securities Dealers (NASD) contracted Bunker Ramo Corp.'s Information Systems Division to provide its Nasdaq automated quotation service for over-the-counter (OTC) issues. This system recently came on-line on schedule.

The second system is Bunker Ramo's Market Decision System 7 (MDS-7) which provides composite data from 21 stock tickers and also accesses a financial news data bank.

In simplest terms, Nasdaq is a flexible and expandable real-time system which allows authorized dealers in up to 2,000 OTC market-making firms to advertise to each other their position in as many as 20,000 OTC securities. The objective was to bring 1,200 CRT terminals in 800 locations on-line at start-up.

In addition, the data, in a limited form, was to be made available to some 35,000 existing on-line quotation devices.

Two Years, $25 Million

A team of about 75 people was given two years and $25 million to obtain (or build) a building, occupy it with redundant central processors and uninterruptible power, lay out and establish 30,000 miles of network and finally install, program and check out the entire system from terminal to processor. The whole system had to be on-line nationwide and together at day one, and the reluctance and skepticism of the trader to trust a computer demanded that it work, and work well, from the start.

Contract specifications required that the CPU handle 28.6 call/sec and response time requirements called for all entries to be processed and available in file within five seconds 95% of the time. Each quote request had to be answered any place in the system within five seconds 50% of the time and within seven seconds 90% of the time.

Queuing analysis led to the distributed intelligence concept to allow the system unlimited capability for expansion. The concept of a central processor and remote concentrators would meet initial needs without unnecessary cost and complexity, and by the addition of satellite processors be expandable while on-line.

It was decided to start up the system with four concentrator locations. Selection of concentrator sites followed the pattern established by the already exist-

(Continued on Page 34)

TI Adds Programmable Version Of Silent 700 Data Terminal

HOUSTON – Texas Instruments (TI) has brought out an "intelligent" version of its Silent 700 data terminal.

Called the Model 742 programmable data terminal, the unit combines features from the existing line with a microprocessor and sells for considerably less than similar intelligent terminals, TI said.

The key feature of this new terminal is the built-in, byte-oriented microprocessor, the firm stated. The microprocessor and 10K memory provide the user with a tape cassette operating system with programmability.

Because the operating system resides in read-only memory, it is nonvolatile and thereby eliminates downloading line charges and system regeneration due to a power failure, the firm stated.

The Model 742's Texas Instruments Cassette Operating Language (Ticol) allows users to generate "fill-in-the-blank" data entry forms; check data for type, size and range; perform standard arithmetic functions; and format data for the user's system.

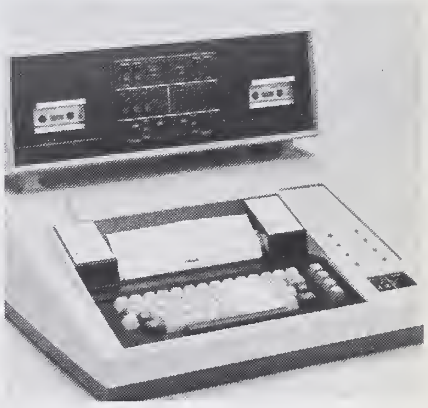
Data collection may be batched independently of the central computer facility with transmission of previously prepared data occurring simultaneously. Consequently, the network data capture process continues even when the system's host computer is down.

Cassettes Included

Contained in a single desktop unit, the Model 742 combines the microprocessor and memory with other standard features such as dual magnetic tape cassettes, nonimpact printing at 30 char./sec, and Ascii keyboard with a built-in numeric cluster.

Other standard features include an automatic search feature for locating and editing data entries; auto-answer and remote terminal control features for unattended operation; dual communications protocols – serial-by-character transmission or 425-character blocks with LRC redundancy check and ACK/NAK auto retransmission; and transmission rates of 1,200 bit/sec.

The unit is priced at $4,925 and leases from $175 to $205/mo, with maintenance, from the firm at P.O. Box 1444, M/S 784, 77001.



TI Silent 700 Programmable Data Terminal

M&M Units Support Mag Tape

ORANGE, Calif. – Singer-M&M Computer Industries, Inc. has announced optional magnetic tape support for its 2780/3780 remote batch terminals.

The tape units support 556/800- and 800/1,600 bit/in. 9-track IBM-compatible drives. They receive and transmit data in both card and print images, which conform to the 2780/3780 communications line discipline, the firm stated.

The option can be retrofitted to installed terminals, an M&M spokesman noted.

M&M's basic terminal configuration includes an intelligent processor, card reader and line printer with optional peripherals available, including an operator's console, paper tape punch, reader and card punch as well as the magnetic tape drives. These can be configured to look like any standard or optional system peripheral, according to the firm.

All M&M terminals communicate at line speeds up to 50 kbit/sec as standard, with print speeds up to 1,800 line/min and card read speeds up to 1,200 card/min. A 64-character print set is also standard with Ascii, Ebcdic and display code available at no additional cost.

The M&M intelligent remote batch terminal also emulates the magnetic tape-supporting IBM 360/20 Hasp multileaving workstation, the Burroughs DC 1100, Control Data U200, GE DN30 and 355 and Univac 1004 Phase II and RMS1 terminals.

The magnetic tape option costs $345/mo with maintenance on a one-year lease. Prices for the basic remote batch system start at $675/mo, including maintenance, from the firm at 2201 North Glassell St., 92665.

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Interface Provides Telex Compatibility

LITTLE SILVER, N.J. – NuData Corp. is offering a custom-built Telex interface called the Series 1006, which the firm said can be used with virtually any type of terminal or line.

The interface can be configured for use with single- or multiline arrangements to allow almost any telecommunication system to be compatible with the Telex line, the firm stated.

A terminal line card meets standard line signaling criteria, and a 20-character programmable answer-back can be provided for systems which do not meet the Telex system answer-back requirements, according to NuData.

The standard unit price starts at $2,000, which includes transmission speed of 50 bit/sec; loop current of 20 mA; Telex interface of ±12V; programmable start of number and end of number; acceptance of all dial numbers simultaneously; generation of programmable codes for "abandon call," "retry" and "busy"; passing of intercept codes; and programmable answer-back for "busy" or "out of service."

The Series 10006 Telex interface can be configured to replace several Western Union Telex interfaces and may be ordered in a configuration suitable for rack mounting, according to the firm at 32 Fairview Ave., 07739.

Parallel BCD Data Converted

NORTH WALES, Pa. – Numonics Corp. has introduced two interfaces for converting parallel BCD data for input into terminals or keypunches.

The 310 interface converts such data for input to either Model 33 ASR Teletypes or RS-232 compatible units.

The 310 offers bit serial Ascii output of up to 15 characters. (Input acceptance is 15 parallel digits of BCD-coded terminal data, TTL logic levels.)

An option allows the user to switch to variable bit/sec rates on the RS-232 output.

Two control signals are available to the inputting device: Send and Busy. To Send, the operator initiates transfer of data via a switch closure or a 5V zero-going logic pulse. Switch closures are automatically "debounced," assuring a single transfer for each time, a spokesman said. The Busy signal is a high TTL logic level that goes low during the actual transfer to the terminal, the firm stated.

The similar 320 interface takes fixed format, parallel BCD and TTL-compatible numerical data of up to 15 characters and interfaces it to such keypunches as the IBM 029 or 026, or the Univac 1700 or 1710.

The Numonics 310 and 320 interfaces each cost about $1,000 from the firm at Route 202 and Hancock St., 19454.

AF Testing Message Decoder, Transmitter

RANDOLPH AIR FORCE BASE, Texas – Most large Air Force bases have a message center manned around the clock by people with high security clearances who encode, decode, transmit and route the base's communication.

In this case, a small processor locked in a desk unit collects incoming messages around the clock, decodes them and outputs them onto a cassette tape.

The processor then encodes the message for transmission over phone lines to its destination. The terminals under test at the base tie into a computer-controlled switch, part of the Air Force's Autodin network.

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Banks Save DP Dollars

Competitors Ally to Form Service Bureau

BUFFALO, N.Y. – Two competing banks here have found they can get better service and save DP dollars by setting up a service bureau to serve them both via telephone links.

Three more institutions will be brought into the network before the end of the year for even greater economy.

The joint venture, named Datek, Inc., stemmed from a need by Western New York Savings Bank and Niagara Permanent Savings and Loan Association for greater systems flexibility to handle new services such as NOW accounts, consumer loans and electronic funds transfers.

At the same time, Western was faced with the prospect of replacing two 10-year-old NCR 315 computers with a system having a greater memory and more capacity for jobs besides on-line processing.

In-House Operations

While both banks were large enough to justify their own systems, they questioned the efficiencies of in-house operations.

Bank officials investigated, and then rejected, a cooperative venture that would have required 10 to 12 thrift institutions to make it practical.

They considered proposals from several vendors and finally ordered an NCR Century 251. One day after Datek was incorporated, the banks began developing a system that could serve them both while maintaining totally independent operations at the same time.

Five months later, Datek was staffed, a security-tight, fireproof building had been constructed near the Buffalo International Airport and the 256K computer was delivered.

Development work was started during this period, and debugging on Niagara's Century 200 gave the service bureau a head start. When Datek took control of the Century 251, all that remained to be done was hooking into the telephone lines and transferring account records.

Within one month after installation, Datek had converted Niagara's loans to the new system. Since then the bank's on-line savings accounts have been incorporated.

The system is linked to the institutions through teller terminals and phone lines.

All the terminals in the first five institutions eventually will be NCR 270 units, but for practical purposes Datek adapted the system to allow the use of the NCR 42, 260, 399, 735 and 736 and video display machines compatible with the communications lines and the computer.

Every window machine has an identification code handwired into it. Built-in controls prevent one subscriber's terminals from retrieving data from the computer files of another.

Overnight Reports

Savings and loan reports are prepared overnight, for use by 7:00 a.m. the following day. Other reports are available monthly, quarterly and on request. The user can obtain in report form whatever the computer routinely processes and has stored in its files.

When all five subscribing banks are brought on-line, 83 teller terminals from 29 different locations within a 50 mile radius will be on-line to Datek's Century 251, a system which presently provides a 2.5 second response to transaction entries.

"Until transactions begin to bump into one another, response time will not suffer," said Datek's president, John S. Kuczwanski.

"Even then," he added, "we do not expect it to be more than four to five seconds."

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- Newly approved major revisions to WATS
- Impact of Satellite Carriers and Specialized Carriers
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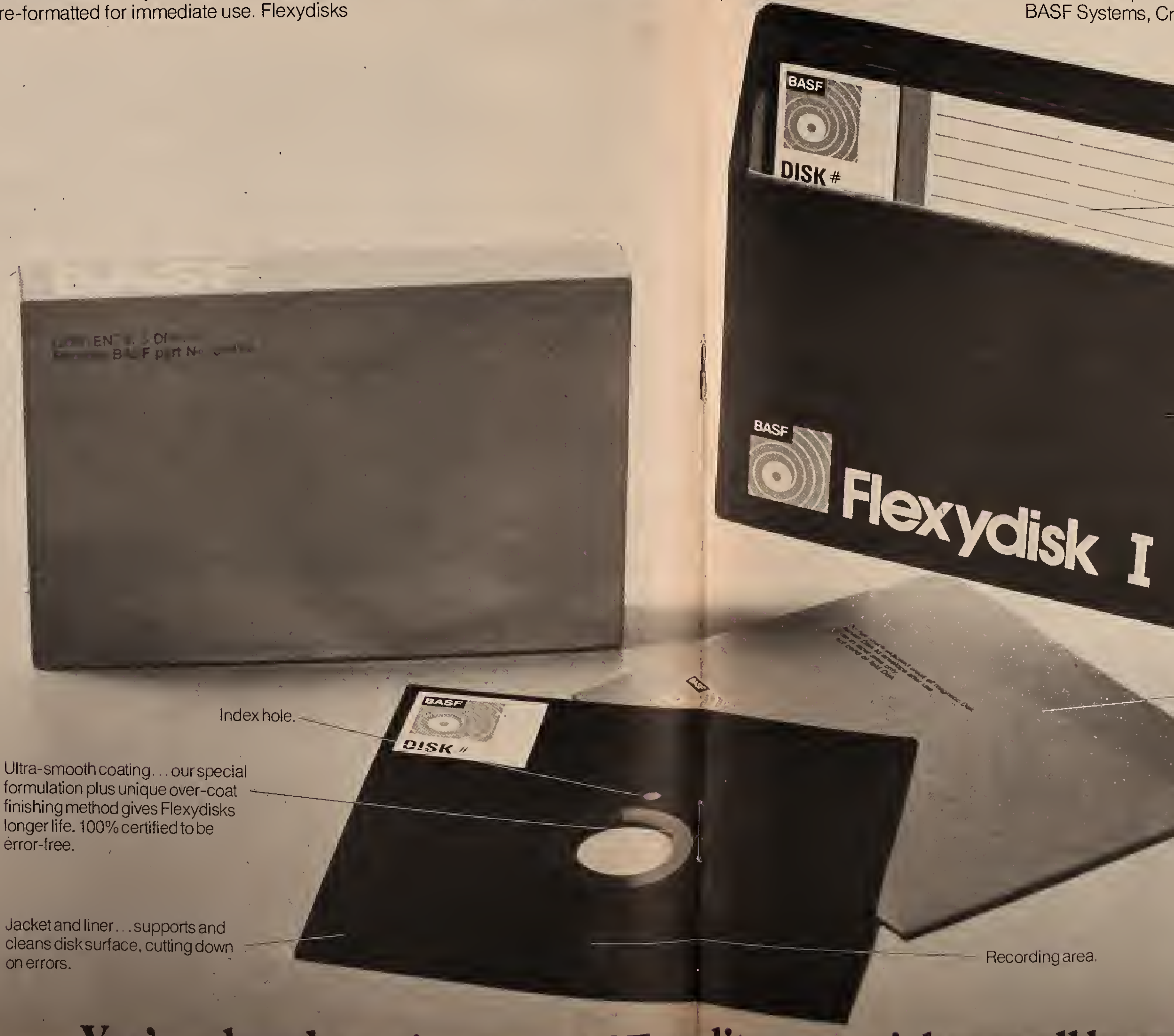

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Concentrators, TDMs Play Large Role in Stock Net

(Continued from Page 29)

ing Telequote system, with 25,000 terminals, but the multidrop lines from the concentrators to the brokers' offices were laid out using computer-aided network design.

Input constraints placed on the computer design were response time objectives and number of terminals per line. Planning called for the use of nested polls to take advantage of the duplex nature of the lines.

Queuing analysis was carried out, using variations in transmission rates and number of terminals per line to arrive at an ideal modem speed (considering economics as well).

Reliability requirements called for duality from the central processor down through the concentrators. Dual Univac 1108s were chosen, supported by multiple peripherals, files, drums and core, all serving dual concentrators over dual high-speed lines.

High-speed lines linking three of the concentrator sites (Chicago, Atlanta and San Francisco) with the central processor, operate at 7,200 bit/sec on dedicated lines, but can be switched to dial-up if necessary. The fourth concentrator site, New York City, is linked with dual 50 kbit/sec wide-band facilities.

Test Runs

Terminals and the specially designed OTC control units (OCU) were tested as part of the normal manufacturing quality assurance program, but several OCUs were shipped to the central processor site to be used in a subsystem test with the concentrators, which were Honeywell DDP-516 computers with Bunker Ramo communications front ends.

Lines were ordered for due dates to allow sufficient time for the terminals to be installed and tested with their respective concentrators. Canned responses were setup in the concentrators and as each terminal was installed, it was checked out on-line to the concentrator and left on.

Test programs were devised based upon traffic projections that were made early in the planning stages. These tests went through some 50 changes in the software before system start-up.

The ultimate test was yet to come: to have a message entered at a remote keyboard and see the response. But the nature of the system required that all lines be active simultaneously for the test to be meaningful. It was decided it would be necessary to use simulation here.

Three of the remote concentrators were loaded with test programs that would appear to the CPU as if there was active inbound traffic. A fourth concentrator located on site with the CPU, was loaded with a program that was closest to the real thing to that date, and control units also on site and connected to the local concentrator were loaded with 20 terminals assembled in a room near the CPU.

Engineers and programmers were set down at the terminals and each was handed a script that called for a specific message to be entered at a predetermined time. Everyone watched the clock and, at the countdown, the keyboard pounding commenced.

Timers were connected to each terminal and at the end of the test, histograms were plotted to show response times achieved. To make the test most comprehensive, the system operated in fallback mode for the test, with one CPU, a third of the drums and a quarter of the tape handlers operational.

The test went successfully, not without incident, of course, and the system was held together on-line for the next phase of testing: actual operation from a CRT terminal connected to each remote concentrator.

Dummy stock issues were entered and operators manipulated prices from the field while test programs in the concentrators simulated traffic. Proving successful in this phase, the NASD authorized the entry of live market information for a shakedown period, with brokers using the system. The shakedown period allowed for the clean-up of the remaining bugs and operator familiarity.

Formal start-up day came and went with nothing more than a fresh page in the log. Activity climbed to an average 900,000 messages daily, peaking at over 100 calls processed per second.

By design, we allowed for double that load. Periodic response time measurements showed that the average was well under three seconds.

The second system, Bunker Ramo's Market Decision System 7 (MDS-7), is a decentralized system, with processor strategically located throughout the country, each identical to the others and each serving a specific region of the country. These processors all access the master data bank and financial news data bank.

As in Nasdaq, it was necessary to bring this system on-line with service available anywhere in the country on day one. But MDS-7 was a subscriber system, and unless sufficient brokers were paying for service from start-up day, it would be prohibitively expensive and complex to set up four or five processing sites each serving only a relatively small number of subscribers.

Since each processor complex would be identical, it was decided to start up the system with only a single processor complex and service the entire nation via TDMs.

The data transmission rate to the terminals would be 2,400 bits/sec, so it was possible to run a series of 9,600 bit/sec lines out from the processor to remote multiplexers located at major population centers and service the regional multidrop lines from those multiplexers.

The choice between intelligent concentrators and TDMs was more difficult. Confidence in 9,600 bit/sec was not that firm, and the idea of servicing synchronous multidrop lines via TDM presented some clocking difficulties.

As it turned out, the choice of TDMs proved to be a good one. Conditioned lines were ordered to handle initial traffic and as the system grew, more high-speed lines and TDMs were added, while second and third processor complexes were built to assume the loads in regions of subscriber density.

In retrospect, the concentrator concept was a major decision in the Nasdaq system. Communications overhead was completely removed from the CPU and placed regionally on the concentrators. Response times obtained on this system confirm this choice since line costs would have been considerably higher without those concentrators.

Heavy involvement of key personnel (who will later operate and maintain the system) during the shakedown period also proved worthwhile. It gave them the exposure needed to cope with failures.

Albert Seedman is a communications engineer for Bunker Ramo's Information Systems Division.

You're in EDP and you've got an information retrieval problem. You're considering moving some routines from paper to terminals. Or maybe you're already using terminals but you've got to enlarge your system.

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Up to 140 Files

Inforex Dedicated Mini Set for File Management

Inforex 5000 has CRT terminals, a disk drive and a tape drive with CPU in the bottom half.

By Vic Farmer
Of the CW Staff

BURLINGTON, Mass. – Users seeking to solve a DP problem which calls for more than just a key-to-disk data entry system – a problem that requires some on-line follow-up of items in a number of separate data files – can take a look at Inforex's System 5000.

The 5000, a dedicated minicomputer file management system, can handle up to 140 files containing a total of up to one million 80-character records. Record size can vary from 10 to 1,839 characters.

The shared processor can access records within "one to three seconds," but the firm said that heavy use by up to 32 CRT terminals and the degree of complexity of inquiries could lengthen the response time.

The 5000 uses microprocessors in the CRT terminals and in the disk and terminal controllers. A universal I/O channel is said to permit fast data transfer and simplified expansion for system components.

No Software Intervention

Hardware search masking allows file and record searching to take place at hardware speeds with no software intervention, the firm said. Memory hierarchy consists of a 64K-byte main memory and several levels of read-only memory in addition to disk and tape storage.

Data can be dumped to IBM-compatible 9-channel 800 or 1,600 bit/in. tape for file transfer.

Three software releases in the operating system are presently available and provide a file management capability consisting of:

- Accessing chronological sequential files.
- Accessing indexed sequential files.
- Performing data entry and field arithmetic.

The system software operates within a three-level hierarchy. A command monitor converts operations request into commands that initiate a series of program service routines in the task monitor.

These routines automatically allocate disk and tape locations, perform manipulations of user data and issue logical I/O commands, the firm said. The operating system translates these logical commands into hardware commands that automatically control the performance of each terminal and peripheral device in the hardware configuration.

The typical user, however, can create files and operate the system by using 41 two-letter commands which can be used to type in a format; create a file; enter, retrieve and modify a record; maintain file security; and dump files for input to a larger mainframe.

A "CF" command, for example, signals the system to accept data to create a new file format; "DT" transfers a file on the system from disk to tape.

The CPU is a 64K-byte mini with 16-bit word length and 1.2 μsec cycle time.

While the firm presently insists the mini is not user-programmable because it is a dedicated system, indications are that users will be able to customize certain applications.

Transaction Logging

Up to two 45 in./sec IBM-compatible tape drives at up to 1,600 bit/in. density can be used for transaction logging and disk-to-tape transfers.

Up to four 25M-byte disk drives use 11-high disk packs to store file formats and file data.

Average seek time through the disk controller is 38 msec and the controller provides hardware search capability in addition to disk control. The controller also controls record blocking for maximum data packing on the packs, the firm said.

The terminal microprocessor performs editing and format control functions. The CRT display uses a 7 by 9 dot matrix character with a 1,920-character display capacity, upper- and lower-case characters and dual intensity control. The dual intensities allow differentiation between format and data characters.

The keyboard has a standard 48-character typewriter keyboard, 22 special function keys and a 10-key numeric pad.

A 30-char./sec serial impact printer has a print width of 80 columns and can be used for data logging, configuration copy printing, working proofs of file contents and audit trail information.

A typical system consisting of a control unit, disk drive, tape drive, printer and three CRT terminals leases for about $2,000/mo on a three-year lease or sells for $91,000.

The firm is at 21 North Ave., 01803.

Tapes Cleaned in Two Passes

LORTON, Va. – The Multi-Magna magnetic tape cleaner, Model 8/16/6250 from Precision Methods, Inc., cleans in two passes 1/2 in. to 1 in. tapes in less than 5-1/2 minutes.

The cleaner utilizes a self-sharpening, slotted cylinder rotating in the same direction as the tape movement but at a relative velocity of 100 in./sec.

Contaminations loosened by the cleaning action are removed by a vacuum device.

The cleaner is priced at $2,350 from the firm at 8825 Telegraph Rd., 22079.

HP Card Reader and Keypunch Handle 80-Col Cards on 2100s

PALO ALTO, Calif. – The HP 2894A card reader/punch from Hewlett-Packard (HP) reads 200 card/min and punches and prints 45 to 75 card/min.

The first 80-column card reader/punch offered by HP, it offers both on- and off-line keypunch capabilities and is fully interfaced to HP 2100 minicomputers. In the U.S., the subsystem sells for $14,250.

The unit features two card input hoppers and two output stackers that enable the reading of data from one hopper and printing or punching of cards from the second hopper while maintaining separation of output. The primary hopper holds up to 600 cards, the secondary 400.

The buffered keyboard stores all incoming data to allow backspacing and character, field, word or record erasure and editing.

Sensed errors can be corrected by the operator prior to entering the data onto the cards. Separate punch and print buffers allow the operator to edit and print information that differs from the data to be punched.

With this subsystem, users can select any one of four programmed card formats from the keyboard. Reversion to an originally selected format is automatic after short-run interspersing of differently formatted cards, allowing a wide range of punching and verifying applications.

During verifying, blank cards are fed automatically from the secondary hopper, then punched, notched and merged in proper sequence. Error cards also are selected automatically and stacked separately in the secondary stacker.

The card reader/punch subsystem, an adjunct to HP's 2000 series management computing systems, is also available without keyboard for on-line use only for $12,450.

HP is at 1501 Page Mill Road, 94304.

116M-Byte Disk Drive Adaptable to Most Minis

REDONDO BEACH, Calif. – A disk drive system with a microprogrammed controller for minicomputers from Peripheral Interface Corp. (Pico) provides reprogramming capability with self-run diagnostics for large capacity, high-speed random access mass storage.

Front panel control over commands permits microprogram editing capability for program changes and allows the user to emulate the CPU without the CPU connected.

Over 116M 8-bit bytes of data can be stored on each disk drive unit and up to four such dual spindle drives can be handled by one controller. Maximum access time is 55 msec.

Pico's disk system is software-compatible with most of the popular minicomputers and it is supplied with basic software. The system is also media-compatible so that the disk pack could be removed and used on another system.

Prices start at $19,000 for a complete system including software, interconnects, cables and documentation. The firm is at 1616 S. Lyon St., 92705.

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Memorex 3673 Controller User Saves 14% on Total Disk Rentals

WASHINGTON, D.C. – The National Education Association (NEA) recently installed the first Memorex 3673 disk controller, a direct interface to the IBM 370/135 integrated file adapter (IFA).

Previously use of a 370/135 IFA precluded independent disks because of incompatibility with controller circuitry integrated in the mainframe of the 370.

"We are saving 14% on total disk subsystem rentals and improving our average access time by 10%," said Ray Lovelace, DP manager at NEA.

Alternative equipment was the IBM 3330 disk facility.

NEA's 3673 disk controller controls the operation of four Memorex 3670 disk drives, each with 200 Mbytes of on-line storage. The disk subsystem is both hardware- and software-compatible with IBM 3330 disks.

The Memorex disk subsystem was installed in early May 1974, concurrent with the installation of the Association's 370/135. During the first week's break-in period the disk subsystem was used to sort more than seven million records.

"During this demanding test period we did not experience any problems or lose even one record," says Lovelace.

Prior equipment was a System 360/40 with a 2314-equivalent disk subsystem from Memorex.

Register Has Buffered Keyboard

MAYNARD, Mass. – Data Terminal Systems, Inc. has introduced a series of stand-alone electronic cash registers that the company says compare in cost with mechanical cash registers.

Each of the Series 300 registers comes with a 10-key buffered keyboard, split pricing, price extension and automatic tax calculation, according to the firm.

The Model 319 provides nine department, six transaction and four summary totals, plus a food stamp tendered key, due bill calculation and a food stamp exception key.

The Model 315 provides six department, five transaction and four summary totals, while the Model 307 provides two department, one transaction and three summary totals.

Side or rear price displays for the customer are optional.

Scanning or communications options are not currently available, the firm said.

The Model 307 costs $1,695, the Model 315 costs $1,795 and the Model 319 costs $1,895. Deliveries begin in October from the firm at 124 Action St., 01754.

Graphics Display Utilizes One Printed Circuit Card

LEXINGTON, Mass. – Using a single printed circuit card, Lexidata Corp.'s Model 200 graphics display generates a 256 by 240 dot matrix or an 18 line by 80 character display on a standard video monitor.

I/O handlers for both RTOS and RDOS are also available.

Designed to interface with General Data Corp.'s Nova minis, the basic display card costs $1,500, Lexidata said.

The company is located at 807 Massachusetts Ave., 02173.

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Dijkstra invented it in 1965. IBM popularized it with the New York Times project in 1971. *Datamation* made it legitimate with their cover story article in December 1973 – structured programming and top-down program design have finally become officially recognized. Several programming projects have deomonstrated that structured programming can dramatically reduce development and testing time; one project experienced an average of only 1 bug per 10,000 lines of code. *What is structured programming?*

STRUCTURED PROGRAMMING CONCEPTS

This one-day course provides an intensive survey of the philosophy and ground rules behind structured programming. Using the major topics listed in the course outline, the student is offered a comprehensive overview of the development, uses and achievements of structured programming. FEE: $100.

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In this three-day course, the student is given a thorough grounding in all the basic techniques of top-down design and structured programming. Case studies, class exercises and programming problems are used to reinforce the principles discussed in the lectures; solutions to the problems will be discussed. FEE: $375.

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The five-day seminar/workshop provides the student with the practical experience necessary to use structured programming as soon as he returns to his organization. The expanded format gives the instructor ample opportunity to discuss all outline topics in detail and a major class project allows the student an opportunity to apply the principles in a controlled environment under the supervision of an experienced instructor. FEE: $575.

INSTRUCTORS

EDWARD YOURDON, an internationally recognized lecturer, author and consultant, has taught structured programming throughout the USA, Canada, Europe and Australia and has acted as both a consultant and a "chief programmer" on several structured programming projects. BOB ABBOTT is Director of Research and Development at YOURDON Inc., where he is in charge of the company's development of proprietary software. Prior to joining YOURDON Inc., he spent 14 years at Equitable Life where he was recently in charge of a large on-line IMS-based information retrieval system with 12 million records.

YOURDON, Inc. and DELTAK, Inc. have co-developed a Multi-Media series of "in-house" Structured Programming courses. For details contact Pete Dignan, DELTAK, Inc., (312) 671-5300.

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9. Defensive Programming - Basic concept. Techniques.

Mini World

Printer, Card Interfaces Fit Many Minis

ANAHEIM, Calif. – Line printer and card reader interfaces manufactured by Media 111 offer the minicomputer systems builder or user the ability to select the line printer and card reader best suited to his particular application.

Available for most line printer/minicomputer and card reader/minicomputer combinations, both interfaces come complete with controller, cables, software and documentation, according to the firm.

Model 2310 interfaces are offered for line printers manufactured by Tally, Data Products, Centronics, Printec and Potter.

Model 2510 interfaces are available for card readers manufactured by Documation, Bridge, Peripheral Dynamics and True Data.

Both line printer and card reader interfaces support minicomputers manufactured by Data General, Digital Equipment, Hewlett-Packard, Digital Computer Controls, Varian and Honeywell and are compatible with the main frame manufacturer's software, the firm said.

Prices for each complete interface kit start at $750. The firm is at 2259 Via Burton, 92806.

Varian V70s Get 16K of Core On PCB Module

IRVINE, Calif. – Varian Data Machines has introduced a 16K word core memory module for its V70 series computers. A single port, asynchronous memory, it employs low drive core and 16K sense on a single printed circuit board module.

A standard V72 computer or V70 series memory expansion chassis can accommodate four such modules for a total of 64K 16-bit words. An 18-bit, byte parity version is also available.

The memory cycle time is 1.2 nsec and its effective cycle time is 900 nsec using a asynchronous bus with optional odd-even address interleaving.

Price of the 16K by 16-bit module is $3,250.

The new memory is an optional feature on the V73 and V74 computers which have used both dual port 660 nsec core and 330 nsec semiconductor memories. All memory systems may be intermixed, allowing each to run at its own speed.

This benefit allows choosing a memory speed hierarchy within each computer on the basis of price and/or performance, according to Varian.

The firm is at 2722 Michelson Drive, 92664.

4-Channel Board For D-116, Novas

FAIRFIELD, N.J. – A communications channel for the D-116 minicomputer is available from Digital Computer Controls. It may also be used with any Data General 1200 series mini.

Designated the 116475, the device contains up to four fully independent synchronous communications channels on a single 15 in. by 15 in. printed circuit board. The synchronous line unit allows the user to select parity (odd, even or none), length of data word (5, 6, 7 or 8 bits) and both transmit and receive synchronous characters.

The unit can be configured with an internal clock to operate from 1,200 bit/sec to 153.6 kbit/sec. Externally clocked it may operate up to 150 kbit/sec.

All options are selected by the user at time of purchase and are included at no additional cost. The unit sells for $1,325 for a single-channel board and $2,075 for a fully implemented four-channel board.

Delivery is 60 days from the firm at 12 Industrial Road, 07006.

Cassettes Use DP Tape

SUNNYVALE, Calif. – Information Terminals Corp. has two cassettes designed for DP operations. Priced at $6, the WP-1 and WP-2 cassettes are made of Polystyrene, with pressed flat slip sheets, perpendicular corner posts and precision tape guides and feature a spring/foam pressure pad. The firm is at 323 Soquel Way, 94086.

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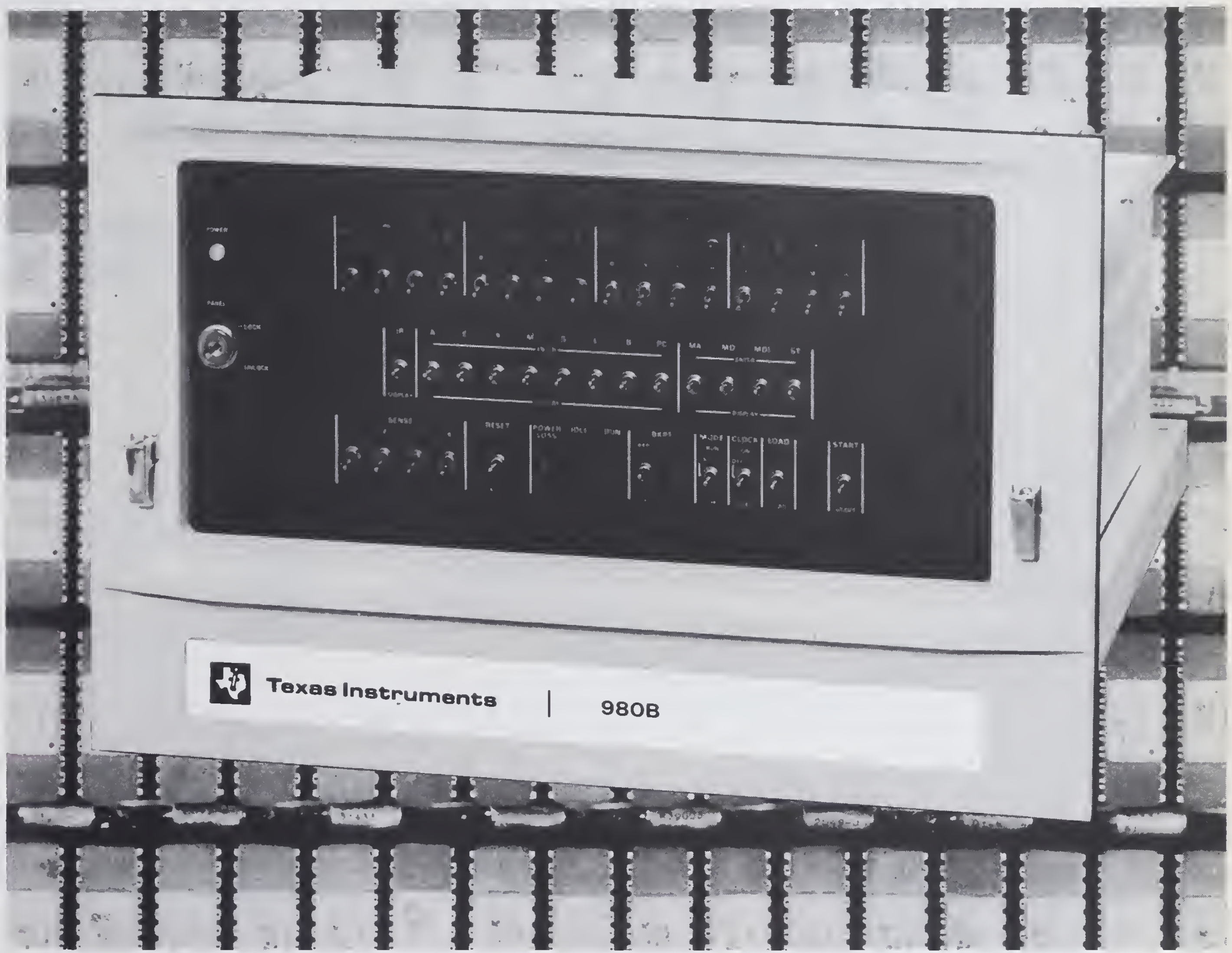

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Central Information File

Teamwork Eases Conversion

Special to Computerworld

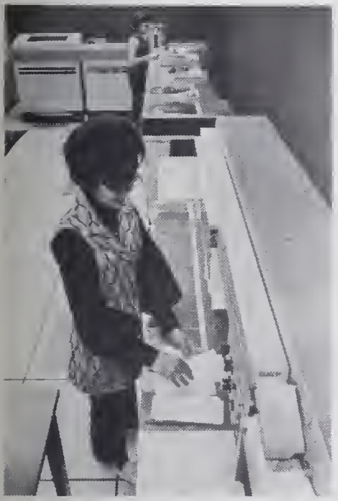
HOPKINSVILLE, Ky. – A double-team approach – both on the part of a bank's staff and that of the computer manufacturer – produced fast conversion to automation and smooth initial operation at the First City Bank and Trust Co. here.

Two vice-presidents of the bank – Don Atwood and Don Buchanan – were given the responsibility for the conversion from the bank's end. During the conversion their day-to-day duties were shouldered by other bank employees.

Meanwhile, NCR, manufacturer of the Century 100 First City installed, assigned four people to the task.

Two factors eased First City's conversion: the bank's demand deposit and savings accounting were previously handled at data centers, and since 1969, First City has had a semiautomatic information file, an electric filing cabinet operated by two employees.

Thus, data at the processing center could be automatically punched onto cards to be fed into the Century and stored on disks. And while the file data at the bank had to be keypunched, at least it was set up in a fashion which eased conversion.



First City Bank and Trust Installation.

"We weren't looking for any drastic problems and we didn't have any, even when we put on demand deposits," said bank President Robert L. Cave. "We got our first day's work out on time.

"Naturally, it's a big decision for a $38-million bank to put in its own computer," he added, "and we wouldn't have considered it, if we hadn't had people like Atwood and Buchanan to take on the responsibility. While we have long had confidence in the manufacturer, we knew that sooner or later we would have to make the system operate successfully on a day-to-day basis, as we now are."

Top-Level Support

"Our approach is that bankers must handle the bank portion of the conversion," said Atwood. "This must involve top management in the selection of equipment and implementation, and middle management to oversee the conversion. Neither outside data processing personnel nor clerical personnel from within the bank have sufficient understanding of bank problems to be in charge of conversion, nor do they have the authority to insure cooperation.

The central information file concept, which is basic to the Century programming, is one major reason this system was selected, according to Atwood. Another was the discovery that it could be utilized for no more monthly rental than First City was paying the data center to handle demand deposit, passbook savings and installment loans.

"We put in the computer on a sound, fully justified basis," said Atwood. "First City is a profit-conscious bank. We are always looking for ways to improve work flow and efficiency."

"All banks realize that a central information file on punched cards or disks can increase profitability," said Cave. "This type of data is essential in marketing – particularly cross-selling, loan decisions and credit appraisal. Also, a central file provides tighter control over credit information generally because it is all in one place.

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Faster delivery. Telefile has these systems in stock now. So you can get this extra added capacity on line in just 30 to 60 days. No broken promises. We deliver.

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Magnetic Tape Buffer Designed For On-Line Storage, Conversion

NORWALK, Conn. – Users can temporarily store over 50,000 characters on 50 ft of an endless loop tape with the Wiltek, Inc., DS-8 magnetic tape buffer.

Designed for on-line storage, buffering and data rate conversion, the unit has separate read/write mechanisms which process an endless loop of 16mm double-sprocketed tape.

Asynchronous read and write are performed incrementally with a packing density of 1000 char./foot at any speed up to 333 char./sec (8-bit characters).

One feature of the DS-8 buffer store is built-in logic which detects input parity errors and substitutes any preselected character in place of the faulty character. The buffer can recognize any input character as a message terminate character and withhold output until a complete message is assembled on the tape, according to the firm.

Standard DS-8 logic allows parity to be inverted from input to output and also permits the number of output stop bits to be selected independently of input stop bits.

Wiltek's DS-8 Buffer Store

Input or output may be five-level or eight-level data. The DS-8 can be programmed to recognize any character as a delay character, the firm said.

Two basic options are offered with the DS-8. A five-level end-of-message option provides special control functions for units operating with five-level data. An edit option allows the user to modify an input data string of up to 164 characters in temporary storage before writing it to tape.

Price of the DS-8 is $3,300 from the firm at Glover Ave., 06852.

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AN OVERVIEW FOR MANAGEMENT OF THE DATA BASE COMMITMENT (2 days)
Defines the Data Base system, elaborating its quantitative and qualitative aspects. Examines the role of the Data Base management package and the complete structure of the Data Base project. Presents the commitment to on-going management, and develops the concept of the Data Base administrator. Investigates the staffing requirements and training commitment for development and maintenance of the talent levels necessary for a successful Data Base system project.

WASHINGTON, D.C.—September 25-26
DATA BASE PROJECT PLANNING AND COST/BENEFIT ANALYSIS (2 days)
Defines in detail all elements, including Data Base administration, of the successful Data Base system and establishes the actions required. Develops the service analysis procedure and the full method for specification of user requirements. Presents the data splitting approach to project design and analyzes the package selection criteria and process. Describes all aspects of cost and benefits, time constraints, and the construction of the complete cost/benefit model. Establishes the principals of Data Base system project design and management, and fully develops the role of the Data Base administrator.

ATLANTA—September 30-October 1
DATA BASE PACKAGE EVALUATION AND SELECTION (2 days)
Describes the present and future role of the packages, and their direct, indirect and operating costs. Considers the economics of building versus buying. Establishes package selection criteria, develops the complete evaluation and selection process. Reviews the DBTG, and analyzes and compares IMS, TOTAL, IDMS, S2000 and ADABAS. Develops a formal evaluation and selection case study.

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Mini Controls Panels Displaying Messages In Public Buildings

NEW YORK – Message board displays, controlled by a minicomputer, are flashing news, weather, advertising and public service messages to travelers at LaGuardia Airport here.

Called "outdoor broadcasting," this new medium includes 10 panels installed in strategic locations at the airport.

Information Concepts, Inc. (ICI) works with Transportation Display Inc. (TDI) to produce the changing message boards. TDI, a service of ITT, provides advertising for air and rail travelers internationally.

The display system's computer, in LaGuardia's case an Interdata 7/16, is programmed to provide timely information which may be changed immediately via teletypewriter input, according to ICI president Tom Towers.

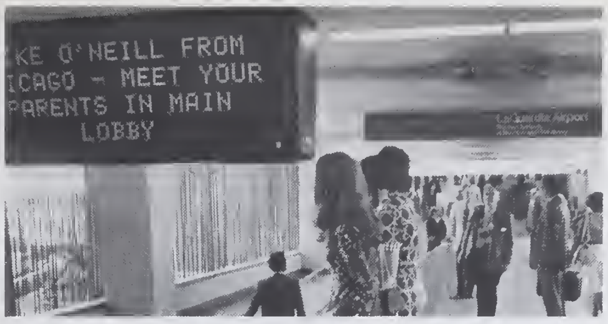
The operator writes the message out on a preprinted form – four lines of 20 characters – to ensure proper spacing and enters it on the teletypewriter.

"The operator can broadcast to the system directly," Towers said. "He just picks one of the upcoming slots, keys in the message and it goes onto the system."

All slots are allotted, he said, so the screen is never empty. The system operates 24 hours a day, with messages changed only if there is a new weather report, news flash or the advertiser changes his copy.

While the LaGuardia system is the only one operating indoors, outdoor systems are in operation at Madison Square Garden in New York, the Spectrum in Philadelphia, the Portland, Ore., Coliseum, outside the Los Angeles International Airport and several other locations.

At least four other indoor airport installations are currently under consideration, Towers said.



One of 10 TDI Tele-Spot panels displays service message.

A technician activates the Interdata Model 7/16 minicomputer to control message display panels at New York's LaGuardia Airport.

County Asks to Remap 300,000 Land Parcels

OAKLAND, Calif. – Impressed with a demonstration in Arizona some 14 months ago, assessor Don Hutchinson has submitted a proposal for the computerized remapping of Alameda County.

The county consists of some 750 square miles or 300,000 parcels of land with various descriptions attached to them, a spokesman from the assessor's office said. With this in mind, Hutchinson has proposed that a computerized system would be much more mathematically exact than other available methods.

In addition, the resulting maps would be of more usable sizes, and a conversion to the metric system – a serious consideration at the moment, the spokesman said – would be just a matter of changing the numbers in the computer, rather than using a calculator for every figure.

The proposed system would use techniques of photogrammetry to inventory the land and an interactive graphic computer system tied into the State Plane Coordinate System.

The proposal lists $1.6 million as the upper cost for implementing the system over a four-year period. This figure includes all hardware, software and consulting fees, as well as salaries, the spokesman stressed. He added that some estimates suggest the cost could be considerably lower.

Among the key elements of the proposal are the use of aerial photography to make an accurate survey and inventory of all land and the adoption of an established land referencing and location system through identification of specific points on both aerial photographs and the maps.

Hutchinson also called for the conversion of all property information into numerical values.

The completed files would allow retrieval of property information by street address, parcel number or the land referencing system, the spokesman said.

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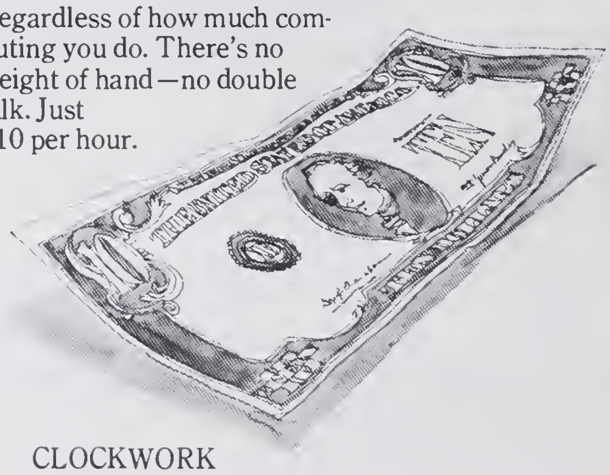

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*CLOCKWORK is available only through our New York office.

Color TV Aided By Checking Dots

BERKELEY, Calif. – Back in the 1940s, if you even had a TV then, you were watching Uncle Miltie, the Camel Caravan and Captain Video on a huge TV with a fuzzy 12-inch black and white picture tube.

Today, your favorite shows come to you on a 25-inch screen in vivid color, thanks to carefully aligned dots or lines placed on your picture tube by experts with the aid of a pair of computers.

At Tinsley Laboratories here, optics experts use a small IBM system in the design and manufacture of lenses that place the dots with an accuracy of .002 inches on tubes, made by many of the nation's leading manufacturers.

These dots, when electronically activated, produce patterns that create color TV pictures.

Believe It or Not

After the TV-tube manufacturer has built a prototype tube and photographically exposed the dot patterns on it with his own lenses, technicians at the Berkeley company check thousands of points for accuracy.

These readings are placed in an IBM 1130 system that designs three-dimensional lenses – one for each primary color – to compensate for the errors in the original tube.

From these designs, an IBM System/7 guides the precision equipment that shapes each corrective lens.

Right Man, Wrong Crime

DAYTONA BEACH, Fla. – A man wanted in a fraud case in California who was carrying the identification of another man here ended up in double trouble recently when he discovered that the man whose ID he was carrying was also wanted.

County sheriff's deputies stopped two suspicious looking hitchhikers and routinely ran their names through the National Crime Information Center (NCIC) computer, based on the identification they were carrying.

One Clean . . . .

One was clean, but the other – a hit.

The second man seemed to be the person sought by a policeman Michael O'Neal in connection with a hit-and-run accident.

The man was turned over to O'Neal for questioning, but O'Neal soon became convinced that the person in custody was not the suspect he was looking for.

Under questioning, the man admitted his real name was Gary Lee Harris and that he had bought the driver's license and Social Security card from the hit-and-run suspect, O'Neal said.

Harris' name then was run through the NCIC computer, and local authorities learned he was wanted by the Los Angeles Police Department in a fraud case.

Harris, charged and booked on obstruction of justice, is being held for California authorities.

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After Center Tour

'College' Tests Public on Nuclear Energy

RAINIER, Ore. – A computer is testing the public's knowledge of nuclear and other forms of energy at the Trojan Visitors Information Center here.

Displays in the newly opened center cover the uses and development of energy and the growing need for more. The center, expected to attract up to 200,000 people its first year, is near the giant Trojan Nuclear Plant that will begin generating electricity for the Northwest in 1975.

After exploring the eight displays, visitors are invited to "Computer College," where they can answer a series of 15 questions about energy or any of 10 CRT terminals.

After touring the displays in the Trojan Visitors Information Center, visitors can test their memories by taking a 15-question quiz administered on CRT terminals by an IBM System/7.

Multiple Choice

The IBM 3270 video terminals are connected to a small computer that flashes questions on their screens. Visitors hold a light pen to the screens to select their multiple choice or true-or-false answers.

"The computer area is one of the highlights of the center," said George Carter, center manager. "It takes only a couple of minutes or so for the quiz, and people have often returned to the exhibits after getting stumped on a question. The quiz gets them thinking about the displays."

Educate Public

The purpose of the center is to educate the public about total energy needs as well as nuclear power, Carter said. The Trojan plant, which will be the first commercial nuclear plant in the Northwest, is located near Rainier, about 40 miles northwest of Portland.

"Although nuclear power has an outstanding safety record, we still have the responsibility to inform the public about nuclear plants, because their use is growing quite rapidly in the U.S.," Carter said.

After visitors finish the quiz they receive a "diploma," indicating they passed the Computer College requirements in nuclear knowledge.

The computer, an IBM System/7, gives the quiz and also prints a daily report summarizing right and wrong answers for each question.

Effectiveness Measured

"We want to make sure people are enjoying and benefitting from the exhibits," Carter said. "We use the report to determine if the displays are doing what they're supposed to do. For instance, one question refers to the amount of electricity generated throughout the country by dams. It actually is a small percentage nationally, but since people out here are used to dams, many think it's greater and miss the question.

"Because of this we're going to change one of our exhibits."

In the future the center may enter different sets of questions into the System/7, based on the different types of audiences that attend. A graduate class in nuclear physics, for instance, would get a much more difficult quiz than would an elementary school group.

It also may add questions to determine visitor opinion of the center. Responses would influence the type of future exhibits.

Energy Projections

Projected power generation of the Trojan plant is 1.13 million kilowatts, enough for 300,000 average homes. It would take about 200 rail cars of coal a day to produce an equivalent amount of energy.

Electricity from the plant will feed into the Northwest Power Grid, serving Washington, Oregon, Idaho and parts of Montana and British Columbia.

Trojan is being built by the Portland General Electric Co., the Eugene Water & Electric Board and the Pacific Power and Light Co.

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Virginia City Plans Tax System to End Assessment Woes

By a CW Staff Writer

HAMPTON, Va. – City officials here are working to computerize assessment records of all residential and commercial property in an effort to equalize assessments and reduce the city's tax rate within the next two years.

The system will analyze the market value of properties by neighborhood, said Kenneth K. Stockman, city assessor.

Particular emphasis will be given to property in areas where there have been no sales on which to base fair market values, he added. These areas will be assessed by comparing them with similar areas in the city where sales criteria do exist.

The city has entered into a contract with Michael Baker III, Consulting Engineers, of Beaver, Pa., to develop the software for the system. Stockman said this aspect of the job, begun last month and scheduled for completion in six months, will cost the city $151,000.

While the city already has the hardware necessary for the project, an IBM 370/135 operating in DOS/VS with 192K memory, the city assessor noted the use of a computer printer will necessitate new forms development.

The proposed system software will place data in the computer so an assessor can obtain an accurate, equalized assessment immediately without manual computation, Stockman remarked.

To facilitate this process, two terminals linked on-line to the 370/135 will be located in the city assessor's office.

In implementing the system, Stockman expects commercial property assessments to be brought in line with those of residential property, an area in which there have been numerous charges of inequality.

"For example, we've had several complaints that apartment dwellers don't pay their fair share in taxes," he said. "We want everyone to be able to say and believe that their area is as equitable as any area in the city."

The city departed from the usual approach to building this kind of system partly to solve the problems of inequity between the two kinds of real estate. Normally, cities or counties buy a software package only to handle assessments of residential areas because of the greater turnover of people there, Stockman said.

Hampton, however, has commissioned a package designed on an income and cost approach to commercial property assessment which, the city assessor contended, can be adapted to meet the assessment requirements of residential areas as well.

He noted also the system eventually will interface with systems in the fire, police, planning and other city departments.

"At some point, a fireman may be able to enter the address of a call into a terminal and receive information from our files as to what kind of house is in trouble – whether it's two stories, brick or wood," Stockman said.

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CI Notes

EMM Pleads Guilty, Fined For Illegal Importation

LOS ANGELES – Electronic Memories & Magnetics Corp. (EMM) has pleaded guilty to five counts of violating federal statutes in connection with importation of products from its overseas assembly operations.

The company has been fined $12,500 for the violations.

Administrative proceedings with the U.S. Customs Service are still pending, as EMM has filed a petition for mitigation of the computed value of the duty underpayment. Customs Service places the value at $416,000, EMM at $136,000.

Sperry Rand Divisions Consolidate

NEW YORK – Sperry Rand Corp. has consolidated the Sperry Remington office systems and machines operations into the Sperry Univac Division.

The Univac Division will now be responsible for the development, manufacture and marketing of all computer systems, peripheral and terminal products, office systems, office machines and other related products.

Gerald G. Probst, president of Sperry Univac, will serve as president of the consolidated operations.

Meeker Gets GSA Promotion

WASHINGTON, D.C. – M. Shy Meeker, who has headed the General Services Administration's (GSA) Automated Data and Telecommunications Service (ADTS), has been named associate deputy administrator of GSA.

In announcing Meeker's promotion to the newly created position, Arthur F. Sampson, GSA administrator, called Meeker "uniquely qualified" for a job that would "fulfill a pressing need to develop a comprehensive program of long-range planning for GSA."

"With our new responsibilities in such areas as emergency preparedness and federal management policy, we have an even greater need to develop long-range plans and programs and the means to implement them," Sampson said.

Meeker, 40, joined GSA in January 1972 after serving four years as an executive with Paccar of Seattle, Wash. He was previously an executive with the Ford Motor Co. in Dearborn, Mich., for almost 10 years.

Warren E. Burton, who has been deputy commissioner of ADTS since September 1973, will serve as acting commissioner.

Data General Speeds Delivery Time

SOUTHBORO, Mass. – During its third quarter ending June 8, Data General Corp. managed to reduce delivery time by 45 to 60 days on several product lines.

Shipments of Nova 2s occurred 45 days after receipt of order (ARO), compared with 75 to 90 days at the beginning of the period.

Nova 840 systems were available 45 to 90 days ARO, down from 120 to 150 days at the beginning of the period.

The time span on Novadisc deliveries was also reduced, and the firm expects the reduced delivery times to extend to other product lines as its manufacturing reorganization continues.

Mum's the Word

POUGHKEEPSIE, N.Y. – A recent IBM internal memo circulated here warned IBM employees not to talk about the relationship between "APL" and "LSI."

European Census Finds

UK Leads in Number of Large Machines

By Molly Upton
Of the CW Staff

LONDON – Germany leads England, France and Italy in the number and value of installed general-purpose computers, but the UK is first in the number of large systems, according to a report by Frost & Sullivan, Ltd. on the European market for data communications equipment, 1974 to 1983.

A breakdown of installed DP bases in various countries at the end of 1972 indicated the existing and future market for communications equipment.

Large computers are defined as those both "capable and likely to support quite large communications networks," while "medium [computers] have potential for communications applications and comprise the majority of new terminal users," the report stated.

Small systems in the report generally are those with limited or no communications ability, including the IBM 1400 series and 1130, but excluding minicomputers and visible record computers.

Germany leads in both the value and number of its installed general-purpose computers, with $2.79 billion or 23.9% of the value of computers in Europe and 7,756 units or 24.1% of Europe's base.

The UK ranks second in terms of value of installed base, with $2.6 billion or 22.1% of the value of computers in Europe.

France is third, with $2.35 billion or 19.6% of the total base, but ranks second in the number of units installed, with 7,195 or 22.4% of the European base, followed by the UK with 6,656 or 20.7%.

The total value of general-purpose computers installed in Europe by the end of 1972 was estimated at $11.72 billion for a total of 32,176 machines, according to the report.

The number of large machines in the UK far exceeds the population in both Germany and France. The UK has 298, Germany 177, and France 164.

The UK also ranks first in the number of medium-size systems, numbering 1,717 compared with 1,320 for France and 1,207 in Germany.

The number of small machines in Germany, however, is sufficient to help it garner the number one post regarding number and value of installed base.

Germany has 6,372 small computers compared with 5,701 for France and 4,641 in the UK, the report said.

The population of computers in Europe breaks down into 886 large, 6,025 medium and 25,266 small computers.

IBM Leads Vendors

IBM is the number one supplier, with a base valued at $6.82 billion or 58.2%. There are about 17,516 IBM units in Europe, or 54.5% of the total number of machines.

Honeywell ranks second in both value and number of units, with $1.19 billion or 10%, having 5,872 units or 18% of the installed base.

Unidata's base, set at $880 million, ranks third in value, with Siemens being the largest contributor of the CII-Philips triumvirate.

However, ICL takes third place in number of units, with 3,596 or 11%. Univac holds fourth place in both number and value of installations, with $730 million or 6.2% of the European base and 2,243 units, or 7% of the total number.

IBM leads in number of installations in all of the large, medium and small categories. ICL, as might be expected from the UK's premier ranking in large machine population, is number two with 173 large machines in Europe, followed by Univac with 123.

Unidata, with 801 units, is second in terms of number of medium-size machines, headed up by CII's base of 375.

ICL ranks third with 737 and Honeywell fourth with 699.

Honeywell ranks second in number of small systems installed with 5,115, followed by ICL, 2,686 and Univac, 1,897.

The report noted that the figures are not definitive but do reflect the national market position by the various mainframers "and hence illustrate the current and immediate future potential for the use of communications."

Study Sees Europe Mini Market Growing To $1 Billion By 1983

By Toni Wiseman
Of the CW Staff

LONDON – The annual market for minicomputers in Europe should rise from $157 million in 1973 to $1 billion by 1983, according to a study by Frost & Sullivan, Inc.

During that 10-year span, the cumulative value of shipments in Europe will come to $6.3 billion, the report projected.

Competition for this market is fierce, however, with a large number of suppliers currently vying for the business and additional entrants expected in the future.

Leaning Toward OEM

The report noted that the market is polarizing toward the OEM sector, generally requiring fairly basic systems, but with a growing proportion in value terms of quite complex multifunction configurations.

Data communications, industrial control, business and laboratory systems will be the dominating minicomputer applications in Europe during the next decade.

Of total cumulative mini shipments between 1974 and 1983, the data communications markets will account for $1.9 billion, or more than 30%.

Shipments will expand from a current level of $60 million to an annual level of $226 million by 1978, "but at that juncture they will stabilize, and from then on slowly decline – because of a severe price erosion," the study forecasted.

Industrial control applications will be the leader in mini applications accounting for over 30% of shipments by 1983.

IBM Will Boost Market

Frost & Sullivan predicted that IBM's entry into the business market would lead to an upsurge in sales, with IBM capturing some 45% of the market. Of the remaining market, 30% will be controlled by visible record computer manufacturers and 25% by other mini makers.

The business market, now valued at $10 million a year, is projected to grow to $300 million by 1983.

Mini suppliers appear "reluctant to enter the business applications end-user market," the study noted, because of the high level of support required and the detailed nature of the application expertise required.

Laboratory systems sales will peak in 1980 with shipments valued at $82 million and decline slowly thereafter, the report said. Current shipment levels are valued at $47 million.

Competition

Contrary to the case of large mainframes, U.S. manufacturers do not dominate the European mini market, the report said. Rather, very small firms, limited to sales within their own country, or subsidiaries of major European firms such as Siemens, Philips and AEG-Telefunken control the marketplace.

Some U.S. companies have a viable showing however. "Hewlett-Packard and Varian have significant proportions of the European minicomputer market," Frost & Sullivan noted, "probably ranking third and fourth respectively in sales immediately after the Digital Equipment Corp. and Data General."

U.S. Mini Shipments May Reach Billion Dollar Mark This Year

NEWTON, Mass. – Total minicomputer and miniperipheral shipments by U.S. makers in 1974 will top the $1 billion mark for the first time, growing 44% above the 1973 level of $893 million worldwide, according to a report from International Data Corp. (IDC).

By 1978, total shipments will exceed $3.2 billion, the market research firm said. Of this total, minicomputer suppliers will account for almost $2.7 billion, up from $1.1 billion in 1974.

Minimakers are becoming far more aggressive in the miniperipherals sector, with end-user add-on business and outright OEM sales, the report noted.

The split between OEM and end-user business is widening in terms of the number of units shipped. In 1974, 68% of the U.S. minimaker shipments were destined for the OEM market, and 32% for the end-user market.

In 1978 the breakdown is expected to see 77% of the units shipped headed for the OEM market and 23% for end users.

Shipments by miniperipheral suppliers will grow to $600 million in 1978, compared with its 1974 figure of $265.9 million, according to the report.

The fastest growing peripheral sector was low-speed printers, with a rate of 57% in 1973-74, the report noted.

"The number of minicomputers shipped to OEM accounts will receive particular impetus from the availability of total systems in the microcomputer range," the report stated.

"A significant portion of the end-user value, on the other hand, will derive from add-on peripheral equipment shipments, software revenue, and maintenance charges."

The IDC report forecast "rapidly growing OEM unit shipments accompanied by soaring end-user market value. With more and more OEM's demanding total systems availability at these low – micro – prices, however, the successful supplier will have to achieve good balance between these two market sectors. The volume in one will offset the high support costs of the other."

Potter Reduces Personnel

PLAINVIEW, N.Y. – Potter Instrument Co. has completed a 25% reduction in its U.S. personnel.

The move was attributed to "the steadily increasing costs of doing business and the need to compensate for the impact of worldwide inflation," according to George W. May, president.

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NTT Communications Services Falling Below Projected Demand

By Toni Wiseman
Of the CW Staff

TOKYO – Faced with a demand falling considerably short of expectations, Nippon Telephone and Telegraph Public Corp. (NTT) has cut its budget for data communication services by 3%. This represents $8.3 million off last year's allocation of $223.3 million.

NTT provides three data communications services: Dress, a sales and inventory management service; Demos, a scientific and engineering calculation service system; and Dials, a telephone calculation service using pushbutton telephones.

NTT had expected demands for these services to almost double each year until 1975 and grow more than 50% a year thereafter, according to *EDP/Japan Report* (EDP/JR). However, by the end of fiscal 1973, Dress accounted for only 364 users with 1,375 terminals, and Demos had 458 users with 520 terminals. These represent only 48% of the projected demand for Dress and 16% of the original expectations for Demos, EDP/JR noted.

International News

Terminals and software have been pointed out as partial causes of the poor showing.

Terminals manufactured to NTT specifications incorporate more auxiliary functions than comparable U.S.-built equipment, EDP/JR stated, leading to higher costs and more maintenance problems.

For instance, the Japanese DT 221 includes error detection functions (parity checks, manual transfer) and a modem as standard rather than optional features, as in U.S. terminals.

The DT 221 also has a faster transfer speed (200 bit/sec) and typing speed (13.3 char./sec) and 128 keys, compared with the slower, less complex TTY 33 and IBM 2741, the newsletter said.

A Japanese firm found that 52% of the terminals surveyed had maintenance problems more than six times a year, nearly 80% of which were in the mechanical parts of the keyboard/printer or tape reader/punch, EDP/JR reported.

NTT has been developing user programs on a custom basis in cooperation with the Dress and Demos hardware suppliers, but this became an overwhelming burden as the customer base grew, the newsletter indicated.

In the software problem area, a Dress subscriber, for instance, has to wait at least a year before he can start using the service with adequate application software.

In answer to this problem, NTT has reorganized its software activities, so that task forces in 11 telecommunications bureaus across Japan will now produce standard packages.

Despite these problems, NTT is emperiling the livelihoods of independent service bureaus. EDP/JR reported that 21 out of 54 independent bureaus in Japan are facing financial difficulties as a result of losing customers to NTT.

Of the 500 service bureaus in Japan, nearly half have annual sales of about $667,000, which means if they lost two or three customers worth $1,000 each in monthly business to NTT, they would find themselves in the red.

In answer to this problem, NTT raised part of its rate schedule for Dress services effective July 22.

Trade Shows Abound For Overseas Sales

WASHINGTON, D.C. – Overseas sales opportunities will be available to U.S. manufacturers through exhibitions at U.S. Trade Centers abroad this fall and winter.

Milan, Italy will be the site of a business automation equipment show, Sept. 20-25. Emphasis will be on accounting and bookkeeping systems, computer cash registers and terminals, microfilm systems and equipment and credit card systems.

The U.S. Department of Commerce estimates that the Italian market for advanced business systems will exceed $900 million by 1976.

Oct. 21-25 are the days slated for a data communications equipment and systems exhibition in London. The UK's domestic consumption of digital computers and related equipment was $473 million in 1973, according to Department of Commerce estimates, and data transmission shows the highest growth rate of any computer sector.

Minicomputers and peripherals are December's featured market sector. The Frankfurt U.S. Trade Center will be the site of the Dec. 3-6 show.

Foreign Orders & Installations

Aussies Pick Honeywell For Telecommunication Net

SYDNEY, Australia – Honeywell has won a $5.6 million order, including a dual 6080 system, for a new Australian Post Office Telecommunications network.

Development of the entire network is expected to cost $43.14 million over the next 12 years. Eventually, a Melbourne center is expected to have three dual processor models of the Series 60 level 66 systems and the Sydney center two dual 66 systems.

"The planned national network will provide computing capacity for the internal DP operations needed to support the telecommunications activities of the post office, which generates more than 95% of the current DP activites," said Senator Bishop, Australia's Postmaster General.

CDC Wins First 170 Order

Australia's Commonwealth Scientific and Industrial Research Organization has provided Control Data Corp. with its first Cyber 170 family order.

The Australian group's Division of Computing Research will lease two Cyber 172 systems, valued at $1 million, to replace a CDC 3600 as the communications front end for its Cyber 76 in Canberra.

To be delivered early next year, the first Cyber 172 will be connected in parallel with the 3600 between the Cyber 76 and a network of more than 25 communications computers. Later in 1975, the second Cyber 172 will replace the 3600.

Other Orders, Installations

Computer Audit Systems, Inc. will install its Cars II audit reporter program in the Rotterdam offices of Moret and Limperg, a Dutch chartered accounting firm. The Bank Leumi, an Israeli banking and financial institution, has also acquired the program.

Air Canada, the government-owned airline, has purchased two 6080 and three 707 Honeywell computer systems to replace existing IBM 360/50s at its data centers in Dorval, Quebec and Winnipeg, Manitoba.

Liverpool University in Brownlow Hill, Liverpool, England, has ordered two Satellite One systems from Computer Technology Ltd. to provide remote job entry facilities to an ICL 1906S.

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International News

ACT Task Force Finds

Yugoslavia Enters Computer Age With Difficulty

By F.C. Stevens

Special to Computerworld

BELGRADE, Yugoslavia – The science of computers in this country is nearly a decade behind that of the U.S.

At the same time, it's right up to the minute. It all depends on your viewpoint.

To the Yugoslav businessman, the need for computers is just now becoming urgent, but he can call on the enormously powerful computing technology as it exists in the U.S. to serve his needs.

Thus he can benefit from the latest state of the art in hardware, but his software capabilities are something else again.

An Advanced Computer Techniques Corp. (ACT) task force presently is in the middle of setting up a system for a major Yugoslav insurance company. The project will concentrate on putting together a totally integrated operation for all lines of coverage (casualty, fire and automobile) as well as life and group disability insurance.

The Yugoslav insurance industry already has reached a certain level of sophistication, so developing an initial integrated system isn't as difficult as might be expected. The real obstacles are the basic differences in management techniques, which are vastly different from those in the U.S.

In socialist Yugoslavia, they don't have what could be called a "normal" management decision-making capability. Just about everything has to go through committees and councils for decision-making.

Thus a typical decision that might be made on the spot in a U.S. computer center might take anywhere from one to two months with the committee system.

Level of Sophistication

Generally, the technological sophistication in Yugoslavia is some six to eight years behind that in the U.S., but the mentality and capability to fill that gap exists in abundant quantities, ACT found.

The major problem is one of appropriate education to handle the new technology.

For example, as part of new programming development, ACT has trained four analysts in the techniques which it has evolved for computer programming management – the basics of how to decide what and what not to do with computer systems.

Even though ACT's primary function is to develop a system and programs from scratch, it has found that its main job in Yugoslavia is to educate the people in doing the job the best possible way.

Political Problems

Politically, there's something of a crackdown going on against insurance companies and import/export banks now.

The government has realized that these two types of institutions tie up great amounts of money, in direct opposition to the basic doctrines of socialism where money isn't concentrated but belongs to everyone.

The government, however, doesn't interfere very much; its presence is felt mainly in the form of red tape. Generally, it doesn't tell a computer operation what it can or cannot do. Instead, government controls involve the mechanics of how to get from point "A" to point "B."

In the U.S. insurance industry, changes simply aren't made on a daily basis. Yet in Yugoslavia, they try to do just that, resulting in outside pressure on the computer center.

One of these pressures is the complete lack of overflow services – there's just no such thing as a keypunch service center.

The result is a center can't staff at level; instead it must staff at peak, meaning that a lot of keypunch operators often are sitting around idle much of the time.

During peak periods, when everyone's working, it's quite common to have a two- or three-month wait for a transaction to turn around.

In the U.S. such operations are thought of in terms of days; in Yugoslavia, it may take weeks, or months.

A Big, But Beset, Market

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BELGRADE, Yugoslavia – Computer use here is increasing at a very rapid rate as businesses are beginning to catch on to basic theories of maximum utilization and consolidation.

The government's operations are getting into the act, too. The country is made up of six republics which operate pretty much independently, and the government is trying to tie them together.

American manufacturers, as a result, are projecting very large sales volumes in Yugoslavia. It's hard to say if they'll reach all of these projections, but the market looks excellent. The biggest U.S. hardware companies here are IBM, Univac and Honeywell.

Once a company gets its product line established in Yugoslavia, the door is open to markets in other Eastern European countries. Belgrade is really the opening wedge to Czechoslovakia, Poland, Hungary and Rumania, all of whom have cooperative trade agreements with Yugoslavia.

It may not be long before key-entry overflow areas in these countries are seen.

A clear field for service bureau operations is present, but the success of such bureaus is going to depend on the type of people they work with in Yugoslavia and the type of local people they work with in Yugoslavia and the type of local organizational setup. The way things are right now, it's virtually impossible for a service company to open up and start selling computer time.

Hardware marketing is handled through Yugoslav manufacturing companies that act as factory representatives.

They're the ones that have to be dealt with to buy a Honeywell computer. The company has separate divisions that provide marketing, support personnel and educational facilities for Honeywell customers.

The marketplace? It's practically virgin country. It's wide open, it's frustrating, it's exotic and it can be very profitable – if one can play the waiting game, doesn't mind wading through red tape and is very, very optimistic.

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ADC Tape Controller Interfaces DEC Minis

SANTA ANA, Calif. – The 45-103 tape controller from Applied Data Communications provides an interface between "all industry-compatible" mini tape drives and the Digital Equipment Corp. (DEC) PDP-8/E, M or F minicomputers. The unit interfaces to both NRZI and phase-encoded formatters with either 7- or 9-track recorders, according to the firm.

The one board-controller is directly interfaced to the DEC PDP-8/E Omnibus.

Two formatters may be individually addressed using the 45-05 cable multiplier. Tape speeds from 12.5 in./sec to 75 in./sec are accommodated by the controller.

The 45-103 controller is priced at $1,300; 45-05 cable multiplier is $50 and the 45-10 8-ft controller-to-formatter is $200. Tape handling software with boot program is $200.

The firm is at 1509 E. McFadden Ave., 92705.

Core Uses Two Modules

WOODLAND HILLS, Calif. – A core memory system which uses two independent modules – a digital storage assembly module and a timing/control board – to provide expandable storage and flexible word lengths has been introduced by Dataproducts Corp.

The two boards in various combinations give storage capacities to 64K with word lengths from 9- to 18 bits.

Designated the Store/38, the system has a basic stack module with a storage capacity of 8K words by 18 bits. By increasing the number of modules, the storage capacity is increased in multiples of 8K words, with only one timing and control board required for eight digital stack modules.

Full cycle time is 750 nsec and access time is 300 nsec.

Store/38 is offered either in modular form, where the user supplies his own chassis, or as an integrated system complete with chassis and back panel wiring. Modules are priced at .85 cents per bit in OEM quantities with delivery 90 to 120 days from 6219 De Soto Ave., 91364.

OEM Products

Other Products

The Semistore III from Monolithic Systems Corp. offers OEMs, a high-speed semiconductor memory system for use under extreme environmental conditions, such as in airborne, shipboard or mobile installations.

With an access time of 385 nsec and 500 nsec cycle time, the Semistore III provides up to 786K bits of memory capacity. It is designed to meet MIL-E-16400 class 3 or 4 and MIL-E-5400 class 1A specifications and features TTl-compatible I/O levels.

The system is available with two power supply options: 3-phase, 400 Hz supply or a 115V, 60 Hz supply from 14 Inverness Drive E., Englewood, Colo. 80110.

– – –

Austron Corp. has introduced an IBM 360/370 multiplexer channel adapter that interfaces 16-bit TTL channels and allows data transfer between them as fast as 50 kbit/sec, according to an Austron spokesman.

The Model 8001 channel adapter is designed for data interfaces with either minicomputers or hard-wired controllers, providing the channel interface standard on all IBM peripherals, the firm stated.

The channel adapter costs $850 with delivery in 30 days from 1915 Kramer Lane, Austin, Texas 78758.

– – –

Numonics has introduced interfaces for communicating parallel BCD data between Tektronix Tek 21 or Tek 31 programmable calculators and a Numonics digitizer or other digital volt meter.

The Model 33 interface enters data unattended on the display data bus of the calculator and responds to the calculator's queries.

The Model 333 can be used in a closed loop system with the Model 533 interface, which outputs parallel BCD data from the calculators.

Both interfaces communicate 12 digits plus exponent and sign.

The Model 333 costs $500 and the Model 533 costs $800. Delivery is 60 to 90 days from Route 202 and Hancock St., N. Wales, Pa. 19454.

Orders & Installations

REI to Lease Input 80s

DALLAS – A West Coast commercial bank has ordered for lease two Input 80 Model B page reading systems from Recognition Equipment, Inc.

The Input 80s will be used to optically read and capture information generated at the bank's statewide branches. This data will include such information as name and address changes and new loan figures. The captured data will be placed on magnetic tape for direct entry into the bank's central files.

The systems have a combined purchase price of $1.14 million.

Other Orders, Installations

The Fort Worth (Texas) City Employees Credit Union has ordered a Burroughs B1714.

Virginia Federal Savings and Loan Association has installed a Honeywell Series 60 system valued at more than $1 million. The system will be used for various banking transactions and will eventually support an automatic teller system.

The Small Business Administration has ordered a programmable Display System from Chi Corp.

The State of New York has ordered a Mark 2 Pacesetter from Photon, Inc. for use by the State Senate.

Great Eastern Discount Department Stores has ordered Sweda point-of-sale equipment.

The U.S. Department of the Army has ordered a dual processor CC-70 communications system from Computer Communications, Inc. to be installed at the U.S. Army Management Systems Support Agency in the Pentagon.

Carnett-Partsnett Systems, Inc. has ordered a Univac 90/70 for on-line warehouse applications.

Koch Industries, Inc. has installed a Burroughs B6748.

Holiday Stores has ordered 17 Datachecker supermarket checkout systems from National Semiconductor Corp.

Burlington Northern Railroad has ordered six additional SPD 904 remote batch terminal systems from Incoterm Corp.

Brooks Brothers has ordered Model 925 MDTS point-of-sale terminals from Singer for its 15 stores.

The Dearborn Heights (Mich.) Police Department has installed a 15-car mobile digital data communications system from Arcom Systems.

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S-Cubed To Study Quake Causes

LA JOLLA, Calif. – A one-year contract to study fluid-rock interaction as a means of predicting earthquakes, using computer simulation, has been awarded to Systems, Science and Software (S-Cubed) here by the Department of the Interior's U.S. Geological Survey.

But the researchers will not be starting from scratch, according to Dr. Sabodh K. Garg, principal investigator at S-Cubed.

Others "have already established that many large earthquakes are preceded by such phenomena as tilting of the earth's surface, changes in mean tide levels and water-well fluctuations," he said.

"It has also been found that the veolocity of sound through the earth changes in advance of an earthquake and then returns to its normal velocity just prior to the quake," he noted.

S-Cubed will use two-dimenstional numerical simulation techniques to study the movement of water through connected pores in plastically deformed rocks. Strains which change slowly with time will then be introduced into the simulation, causing cracks which will affect fluid pressures and fluid migration.

Other Contracts

National Sharedata Corp. has been awarded a $13.8 million five-year extension of its facilities management contract with Liberty National Bank & Trust of Oklahoma City.

National Semiconductor Corp. has received a contract from Alpha Beta stores for 60 Datachecker systems.

R. Dixon Speas Associates has been awarded a contract by National Airlines for the Trip Reallocation and Improvement Program (Trip) crew scheduling system for use in the preplanning of crew assignments for Boeing 727 flight operations.

Computer Sciences Corp. has received two contracts totaling approximately $1.5 million for computer programs for the U.S. Navy's Trident submarine.

American Hospital Supply Corp.'s Information Systems Division has been awarded a contract by the New Jersey Hospital Service Corp. and 13 New Jersey hospitals for shared data processing services.

Incoterm Corp. has received a contract from Japan Air Lines for intelligent terminal systems equipment and services.

Chi Corp. has been awarded a contract by the U.S. Army Military Personnel Center for the conversion and implementation of computer programs for use at their Alexandria, Va., facility.

Digital Equipment Corp. has received a $2.4 million contract to provide a computer network at the Hunter Liggett Military Reservation which will be operated by the U.S. Army Command Developments Experimentation Command.

Contracts

Systems Architects, Inc. has been awarded a contract by the Veterans Administration to design and develop a telecommunications system to support the Department of Veterans Benefits Target system, an on-line system to automate delivery of VA benefits [CW, Sept. 4].

Brandon Applied Systems, Inc. has received a contract from the Federal Communications Commission for the conversion of 324 Salt programs for a Univac III computer to Cobol to operate on a Honeywell 6023.

PRC Information Sciences Co. has been awarded a contract by the Naval Air/Engineering Center to continue development and enhancement of a software system for the Naval Intelligence Processing System (Nips).

Scope Data, Inc. has received an OEM contract to supply nonimpact printers to Tafex Systems, Inc.

Westinghouse Electric Corp. has been awarded a contract by Armco Steel Corp. to supply 12 process control computer systems.

Vector General, Inc. has been awarded a contract from Lockheed Missile and Space Co. for Vectorgraphics 11 systems, which will be used as part of the instrumentation system for the Trident submarine program.

Computer Sciences Corp. has received the first increment of a contract anticipated to total $2 million for system engineering services on the Air Force's Advanced Airborne Command Post Program.

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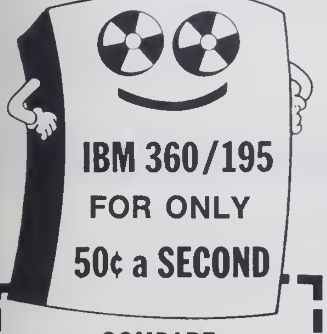

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- Exceptional scope for individual initiative, accomplishment and growth in a large facility using OS/MVT under ASP, with a rapidly growing T/P network.
- Work in a rewarding educational environment, in a campus setting, for a diversified range of both academic and administrative users.
- Involvement for Systems Programmers in the development of new systems as well as the maintenance and optimization of current operating systems.
- Involvement for Systems Analysts in the development of new administrative systems and in studying the applicability of computer methods to many aspects of the academic community.
- Applications Programmer involvement in the implementation of administrative systems or the support of general academic usage, the latter a combination of developing applications packages and consulting with faculty and students.
- Salaries fully commensurate with qualifications, plus an excellent benefits plan including free tuition, 4-week vacations, and liberal holiday observance.

Investigate these opportunities in confidence by sending resume and salary requirements to:
Employment Manager
Columbia University
209 Dodge Hall
116th Street and Broadway
New York, New York 10027

COLUMBIA UNIVERSITY

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PROGRAMMERS

We are a major Fortune 500 manufacturer of nationally-known proprietary drugs, toiletries, cosmetics and household products. Our progressive Data Processing Department has a 1.5MB 370/155 installed using OS/MVT and IMS for our on-line 3270 TP network.

We are interested in talking with people who have a good foundation in data processing concepts including knowledge of ANS COBOL and who wish to apply that knowledge by working closely with a particular segment of our company. Our major development efforts are in the areas of manufacturing, accounting, order processing, personnel and sales statistics. Job title and salary dependent upon skill level.

Our headquarters and all DP support are located in Memphis . . . one of the fastest-growing and cleanest cities in the nation. Interview expenses fully paid and liberal location assistance provided.

If you are interested in talking with us about a specific opportunity, please send your resume in strict confidence to: S.D. Gould, Professional Placement Administrator.

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Personnel Department C
P. O. Box 377
Memphis, Tenn. 38151

MAYBELLINE — SOLARCAINE — MEXSANA

PROGRAMMER ANALYSTS

San Francisco

Salaries $12-18,000

These are extraordinary opportunities for the individual with 3-4 years OS Cobol or ALC experience who wants to enhance his or her lifestyle by living in the beautiful fascinating, and sophisticated San Francisco Bay area. Our client, headquartered there, is experiencing exceptional growth which creates outstanding challenge and exposure. They offer a great number of positions with excellent benefits and relocation allowance.

McCormick & Associates is a high ethics, low key recruting firm with a specialty in the computer field. In Chicago and Cleveland we represent ESP Associates; one of the nations largest most respected, and most effective EDP placement networks. We therefore have access tc opportunities on a nationwide as well as a local basis.

To the qualified we offer a no nonsense approach which makes the transition from your present position to your next opportunity a pleasant experience rather than an ordeal. We invite your inquiry.

Our client will interview candidates for the above position in the Loop area Chicago area on September 16nd 18.

THE EMPLOYER ALWAYS PAYS OUR FEE

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386 No. York Street
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601 Rockwell Avenue
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(216) 861-5626

EDP Managers/Analysts

Grow with Parke-Davis

There are many opportunities for growth at PARKE-DAVID, a leading midwest manufacturer of pharmaceutical products. You could become a part of an extensive expansion effort recently started in six major application areas. These efforts will be developed in an OS/VSZ-HAST-TSO-IMS environment.

If you have reached a high level of professionalism and are seeking a ground-level opportunity with career growth potential, we would like to talk to you. Your 3-5 years management/supervision background could have prepared you for one of the following positions:

DATA SERVICE MANAGER
Manages operations, technical support, data control/entry, and hardware evaluation areas.

SYSTEMS DEVELOPMENT MANAGER
Directs diverse applications development departments ranging from research to financial.

PROJECT MANAGER
Manages a team in the development of a finished goods inventory system.

SENIOR SYSTEMS ANALYST
Design and programming in accounts receivable, inventory materials control and purchasing, order entry/processing, manufacturing or marketing.

Your experience with consumer goods manufacturers would be a plus. Exceptional salary and benefits plan are being offered with all of these above positions. Please send your resume and salary requirements to:

PARKE-DAVIS

Mr. John L. Woll, Jr.
Manager, Salaried Personnel
PARKE, DAVIS & COMPANY
P.O. Box 118
Detroit, Michigan 48232

REAL-TIME & SYSTEMS PROGRAMMERS

Challenging opportunity to broaden your scope and maximize your creativity in the truly professional environment of Burroughs Great Valley Labs, where we are increasing the state of the art in avionics, air traffic control and data communications systems. As a member of the permanent staff of the Special Systems Division of one of America's most innovative computer companies, you'll find room for unparalleled technical advancement, career satisfaction and personal gains. BS or MS in engineering, math or computer science required, plus no less than 2 years of experience related to any of the following areas:

SYSTEMS PROGRAMMING

To design and develop executives, compilers, assemblers and support software.

DIAGNOSTIC PROGRAMMING

Support hardware maintenance programs.

DATA COMMUNICATIONS

To design and develop software in a real-time systems environment with store and forward message switching facilities, information retrieval systems, and I/O controllers.

REAL-TIME CONTROL

Must know assembly language for real-time executive and interactive programming. Familiarity with ATC systems a plus.

Excellent salary and unusually fine benefits highlight these high potential positions in suburban Philadelphia. Please send resume with salary requirements to:

Mr. William Kennedy, Dept. C
Burroughs Corp., Great Valley Laboratories
Paoli, Pa. 19301

Burroughs

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New facility, new opportunity!

NCR

SPECIAL SYSTEMS DIVISION

An opportunity to join a team of highly skilled professionals is available at our new facility in San Diego's picturesque Torrey Pines. Our division personnel are involved in the development of very large scale commercial on-line EDP systems including multi-processors and mini-based communications network. Immediately needed are professionals in the following areas:

SIMULATION AND ANALYSIS

This position requires minimum of 3 years' experience in computer systems thruput and capacity studies, simulation experience using SIMSCRIPT and a familiarity with statistics and queueing theory. A minimal educational level of BS is preferred.

SOFTWARE DEVELOPMENT

Entails the analysis, design and development of telecommunications and minipcomputer software. Requires 3 years' experience in software programming and telecommunications software knowledge of minicomputers and familiarity with assembler level coding. A related BS degree is preferred.

This is an excellent opportunity to join a dynamic team which enjoys challenging work, excellent working conditions and a new facility only 2 miles from the Pacific Ocean and the famous Torrey Pines Golf course.

Submit resume immediately, including training, experience and salary history to: Bruce Bertsch, Manager Industrial Relations.

NCR

SPEICAL SYSTEMS DIVISION, Dept. 6001
16575 W. Bernardo Drive
San Diego, Calif. 92127
An Equal Opportunity Employer

BROWN UNIVERSITY

Applications are invited for the positions of

Manager of Computer Operations and **Systems Programmer** in the university's center, equipped with an IBM 360/67 system, running under CP-67/CMS and OS. The former will be responsible for organizing and controlling all computer operations and their interface with users; in addition to technical competence, he/she must have ability to manage personnel and relate to users' problems. The latter will be member of a small team responsible for the maintenance and development of software. He/she must be adaptable and willing to learn new systems. Please send resume, salary history, and requirements to:

Professor Walter Freiberger
Director of Academic Computing Services, Box F, Brown University,
Providence, R.I. 02912

EDP Instructors

We need additional instructors to participate in a well established curriculum. With several units of 360/370 hardware and a company management that strongly supports an aggressive EDP program, we feel these positions represent a fine career opportunity.

INSTRUCTOR — ADVANCE SUBJECTS — Requires minimum of three years applications and/or software programming on COBOL and BAL on IBM 360/370 hardware. On-line application a plus. Degree desirable.

SYSTEMS INSTRUCTOR — Minimum one year programming background. Preferably with IBM 360/370 and two years as a computer oriented analyst. Degree Required. Both positions require either education courses or demonstrated skill in presentation of seminars.

Complete fringe benefit program. A fine place to work in a comfortable city in which to live. Send resume including salary requirements in confidence to:

Employment Manager
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SR. SYSTEMS ANALYSTS

The Foxboro Company is the world's leading supplier of instruments and computer systems for Process Management & Control. We're providing the systems that permit more efficient processing of existing fuel, foods, textiles and chemicals, while we work with our customers to build maximum efficiency and productivity into the facilities they're building for the future.

It's a big job. It requires people of many varied backgrounds, talents and skills. Some of the people we need, right now, are described below.

You will be responsible for the development and implementation of major systems utilizing IMS Data Base and Teleprocessing in a 370/155 environment. The position involves overall project responsibility. An advanced degree is desirable. A minimum of five years' systems experience in a manufacturing environment and a thorough understanding and experience with teleprocessing is required. Data Base experience and/or prior major project responsibility will be helpful.

SR. SYSTEMS PROGRAMMERS EDP

A Bachelor's degree in technical or business desired, with an advance degree desirable. (Education may be waived for sufficient experience.)

Three years' experience in a large scale O/S multiprogramming installation. Experience with OS/MVT, HASP, and ALP are required. Experience in completing major software projects including planning, scheduling, and implementing projects in the following areas:

* Generate and maintain operating system.
* Install, maintain, and tune software products.
* Technically evaluate software and hardware
* Monitoring computer performance & maintaining overall computer efficiency.
* Implement computer job accounting system and provide various management reports.
* Provide technical support for systems analysts and programmers both within and outside of Management Systems.
* Monitor utilization of computer memory and disk space and make recommendations of practices and standards.
* Planning and implementation of hardware and software systems outside of Management Systems, such as time sharing and RJE.
* Participate in projects involved in planning and implementing systems connecting Foxboro manufactured computer to the 370 computer.

BUSINESS APPLICATION PROGRAMMERS

You will be responsible for the design, creation, implementation and documentation of programs in a variety of project areas including Manufacturing, Finance, Distribution, Marketing and Engineering. Candidates should have at least two years' Business Programming experience, preferably with some background utilizing IBM 360/370 hardware and experience with COBOL and OS JCL. A college degree and experience with disk files, data bases, teleprocessing and on-line systems is desirable.

To arrange for an early interview call Mr. Henry Sypher, Professional Staffing, at (617) 543-8750 or send your resume or a detailed letter to Mr. Henry Sypher, Professional Staffing, The Foxboro Company, Dept. CW-911, 38 Neponset Avenue, Foxboro, Mass. 02035. Foxboro is an Equal Opportunity Employer.

FOXBORO

PROGRAMMERS AND ANALYSTS

Our rapidly expanding, multi-division company, headquartered in Oak Brook, needs several professional programmers and analysts. The programming positions require in-depth knowledge of ANSI COBOL under IBM 360 DOS. The systems analysts' openings require experience in manufacturing and financial systems and good communication skills. Knowledge and experience with data-base in communications software are added pluses. We offer an excellent salary coupled with a generous range of fringe benefits. If interested, send a detailed resume including work/salary history and position growth to:

MANAGER INFORMATION SERVICES
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Oak Brook, Ill. 60521
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CLOW

IMS SYSTEMS PROGRAMMER

FLORIDA LOCATION

Applicant must know:

- IMS batch and TP programming
- 360 ANS COBOL and Assembler
- 3270 CRT features
- IMS generation and maintenance
- Data Base design, PSB's, DBD's
- OS JCL
- BTAM

If you have all of the above qualifications, enjoy solving problems and would like to live in the most desirable climate in the nation, submit your resume in confidence, including salary history to:

James W. Rilling
GAC
7880 Biscayne Blvd.
Miami, Florida 33138

MEMO

TO: SALES/MARKETING PROFESSIONALS IN THE COMPUTER SERVICES INDUSTRY.
FROM: SYSTEMS & COMPUTER TECHNOLOGY CORP. (SCT)

SCT is seeking several highly qualified, well motivated sales/marketing professionals to sell our services. Positions are available in the eastern, mid-western, and western parts of the country. Some travel is required.
SCT is a computer services firm specializing in systems consulting, "non-package" proprietary software and data center management for public agencies and institutions — colleges/universities, hospitals, and cities, counties and school districts.
SCT is headquartered in West Chester, Pa., with technical offices in Baltimore, Nashville, Louisville, Miami, Chicago, Sacramento and Portland. Additional expansion of our rapidly expanding, well financed firm is imminent.
Interested candidates should be self starters with a proven sales/marketing track record acquired via systems consulting, software, or computer facilities management sales experience. Generic application experience in our served markets would be a definite plus.
SCT offers equity (we are still privately held), top salaries and heavy responsibility. If qualifications can be met, please send a resume or letter outlining your qualifications.

FREDERICK A. GROSS, PRESIDENT
SYSTEMS & COMPUTER TECHNOLOGY CORPORATION (SCT)
SEVEN NORTH FIVE POINT ROAD
WEST CHESTER, PENNSYLVANIA 19380

IMMEDIATE
OPENINGS IN

COMPUTER SYSTEMS

NCR

DATA PROCESSING DIVISION

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ENGINEERING TEST PROGRAMMERS

Positions will involve logic test generation for large circuit cards using automatic tests generation software. Task will also involve the review and modification of new logic designs for test ability purposes. Candidates must have logic design experience and working knowledge of at least one programming language. BSEE or Computer Science preferred. Positions available at all experience levels.

SOFTWARE DEVELOPMENT PROGRAMMERS

- Data Management Software
- Executive Software
- Compiler Design

Positions available in analysis, design and implementation of data management, executive software and compiler design. Experience in one or more of the following areas is required.

- Data base/file management
- Telecommunications, multi-programming/on-line systems
- Executive software file access method
- Sort and recovery systems
- Design on peripheral I/O software
- RPG II Programming on Systems 3

BUSINESS AND TECHNICAL SYSTEMS ANALYSTS

Openings exist in several areas of our systems specifications and analysis department to do the following:

- Analyze industry trends and translate into product requirements.
- Develop and present new product proposals.
- Evaluate total systems and software for advanced computer products. Develop requirements for new systems, do competitive analysis, and develop performance data using digital simulation techniques.
- Scheduling and budgeting R&D programs.

Employees will enjoy excellent salary and top working conditions with a non-defense employer. Fully paid life, hospital and medical plan for employees and dependents. Full travel and relocation allowance. To apply, send resume including salary history to the Professional Placement Office at the address below.

NCR

DATA PROCESSING DIVISION
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SENIOR SYSTEMS PLANNERS

EDP HEALTH SYSTEMS

Blue Shield, a leader in healthcare innovations in Massachusetts, is expanding the professional staff of the Systems Planning Division to include a small select group of Senior Systems Planners.

These individuals will analyze present healthcare delivery systems, including manual and computerized reporting and payment systems, evaluate the impact of pending national healthcare plan options, and develop real time responses and solutions.

Here is a unique opportunity for an innovator, who has a knack for combining theory and EDP Systems Technology, to directly participate in the development of new Healthcare Systems.

Requires proven experience in analyzing healthcare systems with an awareness of the impact of pending national health insurance legislation. Diverse experience in computerized systems, languages, and hardware required, including ability to communicate effectively, both orally and verbally, with users.

Excellent salary range commensurate with experience. Complete benefit program.

Please send resume, call or apply in person to Personnel Department, 3rd Floor, 140 Federal Street, Boston, Mass. 02110, 357-8000, between 8 a.m. and 4 p.m.

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Software/Firmware Project Engineers

Software Project Engineer
Needs are for a person experienced in the use of BASIC, APL, FORTRAN and/or minicomputer machine language. Types of experience required includes generation of drivers, assemblers, operating systems, data structures, etc. Your ability to work efficiently with people toward an established goal is important.

Firmware Project Engineer
Substantial experience in the design and implementation of interpreters or compilers such as BASIC or APL is a prerequisite for this position. Hardware experience might include minicomputer or programmable calculator design or development projects.

The ideal educational background would be a BSEE, MS Comp. Sci., though experience will replace either.

Tektronix, Inc. develops, manufactures, and markets internationally recognized precision electronic instruments, computer graphic terminals and programmable scientific calculators.

Salary is open. Benefits include liberal educational support, insurance and profit sharing programs.

Please send detailed resume to: Bill Eppick, Tektronix, Inc.,
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COMPUTER OPERATIONS ADMINISTRATOR

$16,037—$20,384. Supervises Honeywell H6044 computer operation with remote Data Communications. Requires extensive experience in management of computer operations with related management activities, plus college and training in systems analysis, management and supervision. Apply: Personnel Department, Room 500, 251 West Washington, Phoenix, Arizona 85003.

WANTED:

2 EDP HARDWARE PLANNING SPECIALISTS
15 PROGRAMMER/ANALYSTS

Southern New England Telephone, part of the Bell System and one of the largest corporations in Connecticut, is expanding its computer operations. It has immediate openings for two specialists in EDP hardware planning and 15 programmer/analysts.

The hardware specialist must have a broad EDP background. Familiarity with a 370/165, 370/158 computer complex and software is a must. Engineering or computer science degree required. Advanced degree helpful.

Programmer/analysts must know Cobol and/or BAL. Also openings in teleprocessing area for people with CICS experience.

Excellent salary and complete company benefits. South Central Connecticut location. Excellent schools and colleges, fine residential areas. Many cultural and recreational activities. Close to New York City.

Interested, qualifed applicatns should send resume, including salary requirements in confidential to:

Mrs. Karen Hugret
Southern New England Telephone
153 College Street
New Haven, Connecticut 06506

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Computer Professionals

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Most of the major EDP employers in America, aware of our leadership in the field, rely on ESP Associates for their personnel needs. Every hour of every day new career opportunities constantly flow into our offices across the nation.

If you have wanted to relocate to your favorite area, now is the time to do it. Simply contact your nearest ESP Associates office. We'll find you an ideal career position in your ideal area ... and before you move!

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Elmhurst, Illinois 60126

CLEVELAND
McCormick & Associetes, Inc.
601 Rockwell Avenue
Clevelend, Ohio 44114

DALLAS
Deta Processing Cereers
Suite 1109
Stemmons Tower West
Delles, Texes 7S207

DETROIT
Electronic Systems Personnel
170S Fisher Building
Detroit, Michigen 48202

HARTFORD
Compess, Inc.
900 Asylum Avenue
Hartford, Connecticut 0610S

LOS ANGELES
Cereer Dete Personnel Agency
Suite 323
3303 Wilshire Bouleverd
Los Angeles, California 90010

MILWAUKEE
EDP Consultants
11430 W. Bluemound Road
Weuwetose, Wisconsin S3226

MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mell, Suite 1716
Minneepolis, Minnesote S5402

PITTSBURGH
Electronic Systems Personnel
106 Lewyers Building
428 Forbes Avenue
Pittsburgh, Penne. 1S219

SAN FRANCISCO
The Computer Resources Group, Inc.
303 Secremento Street
San Francisco, Cel. 94111

WASHINGTON, D. C.
ESP Systems Corporetion
Suite 210
1211 Connecticut Ave. N.W.
Weshington, D. C. 20036

esp associates

Executive and Technical Search Consultants

MULTI PROCESSING, INC.
Four Militia Drive
Lexington, Mass. 02173
Contact: Joe Vito
(617) 861-6300

COMPUTER PROFESSIONALS

An expanding U.S. Manufacturing Corp. located in a suburban northeast community has requested a search for the following E.D.P. professionals:

SYSTEMS/ANALYST .. 20K
3-5 yrs. major systems exper. Candidate must have leadership abilities. BS degree required. Master's a plus.

SR. PROGRAMMER ... 18K
Exposure to large projects, heavy COBOL mfg. + bus. applications.

SYSTEMS/ANALYST .. 16K
1-2 yrs. data base design large 370 exper. Excellent promotional opp. to project leader.

PROGRAMMER (4) ..13-18K
Min. 1 yr. general mfg. + bus. exper. COBOL, Bal or PL/1 desirable.

Career Advisors
125 Wolf Road, Suite 408
Albany, N.Y. 12205
(518) 458-1810

Our client companies assume all fees.

FACULTY POSITIONS

Several faculty positions are open in computer science. Starting date flexible. UTD offers M.S., M.A.T., and Ph.D. degrees. The undergraduate program begins in 1975-76. Candidates should be able to teach computer science at all levels, perform recognized research and submit quality grant proposals. UTD has a special structure eliminating departments so as to encourage interdisciplinary activities. **Contact John Van Ness, Head, Graduate Program in Mathematical Sciences, University of Texas at Dallas, Box 688, Richardson, TX 75080.**

SYSTEMS ANALYST PROGRAMMER

This midwestern subsidiary of a major bank holding company needs an individual to assume responsibility for the design and development of on-line data systems relating to mortgage banking. Background in manufacturing or financial applications will be considered. The successful candidate will have experience with CICS and DOS as well as a strong background in Assembler, and will be working with a 370/135 DOS/VS, CICS/VS and 3270's and 3340's.

Position offers excellent salary commensurate with experience, a liberal benefit package, and ample opportunity for professional growth. Please send resume in confidence to or call Alison Carroll, (313) 352-1834.

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EDP

Systems Analyst

Must have degree in Physical Science, Engineering or Mathematics or Business Administration, with 1 years experience in EDP, preferably IBM 1130, FORtran or a directly related field.

Applicant must be willing to transfer to Houston, Texas, if necessary.

Submit resume outlining education experience and personal history to:

Employment Supervisor

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1100 Milom Building
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SYSTEMS PROGRAMMER

New Hampshire

Immediate opening for applicants with the following experience:

- ANS COBOL
- ASSEMBLER
- BTAM (or any other teleprocessing experience)
- DOS/VS or OS/VS (360/145 presently installed)

We offer a pleasant working environment in central New Hampshire, close to the White Mountains, crystal-clear lakes, ocean, hunting, fishing, hiking; in a pollution-free atmosphere.

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Blue Cross and Blue Shield
Two Pillsbury St., Concord, N.H. 03301

SYSTEMS PROGRAMMER CICS INTERNALS

Nationwide Tele-processing network dual 370-158's — going VS2. Need CICS Internals expert. Must have worked in CICS dump analysis.

SENIOR SYSTEMS ANALYSTS

ON-LINE SYSTEMS DESIGN ENVIRONMENT

Growth opportunity for data processing professionals. High visibility developing and installing both batch and on-line systems. Minimum six years experience with proven systems design and implementation. Degree and media or manufacturing background preferred. Experience in dealing with time sharing services in manufacturing and/or financial systems is helpful.

We offer an excellent starting salary depending upon experience and ability.

Please submit your resume which must include salary history to:

Pat Callaway, Personnel Department

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Operating Systems Programmer

Fisher Scientific Company has an exciting opportunity for the right experienced "Operating Systems Programmer" who desires some supervisory responsibility.

- Heavy DOS, OS experience on large IBM 360/370.
- 3-5 years increasingly responsible experience.
- Actual "on line" TP experience with multiple, multi-drop circuits.
- 3270 terminal equipment.
- Working knowledge of QTAM and BTAM or TCAM.
- Effective communications skills with ability to supervise and direct software implementation.

If you have these qualifications and you are looking for challenging career oriented employment, we are interested in talking to you. We offer an excellent salary, a comprehensive benefits program, paid relocation and most importantly, growth. Send resume detailing your qualifications and indicating present salary to:

Mr. James F. Richardson

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DIRECTOR-COMPUTER CENTER
STATE UNIVERSITY OF NEW YORK

Central Machine Services of large multi-campus university system. Responsible for management of large, complex facility that provides service to users in administrative and interactive information and retrieval areas.

DESIRABLE QUALIFICATIONS: Masters Degree or equivalent with extensive experience in data processing management including expertise in systems design, systems programming and teleprocessing.

SALARY: $26,000-$34,000.

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Data Processing Officer
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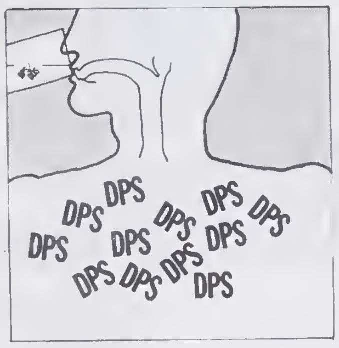
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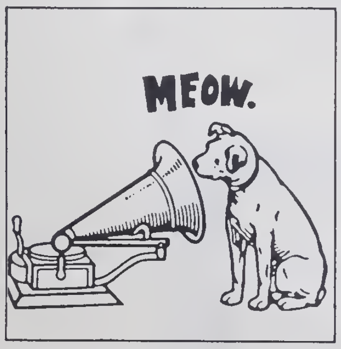

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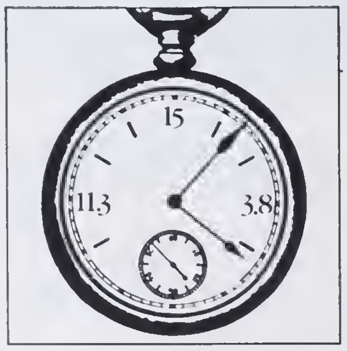

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Earnings Rise

EMM Quarter Revenues Top $31 Million

LOS ANGELES – Revenues and earnings rose in the second quarter and six months at Electronic Memories and Magnetics Corp. (EMM).

Earnings in the quarter totaled $2.2 million or 36 cents a share compared with $1.7 million or 27 cents a share in the year-ago period. Income before special credits totaled $1.2 million compared with $1.1 million in the same 1973 period.

Revenues for the quarter jumped to $31.3 million from $26.9 million in the year-ago quarter.

For the six months, revenues rose to $57.6 million from $51.6 million last year.

Earnings totaled $3.9 million or 63 cents a share compared with $3.4 million or 54 cents a share in the 1973 half, while income before credits rose to $2.2 million from $2 million.

During the first half, incoming orders exceeded shipments by about $8 million. Backlog as of the end of June totaled $66 million, up 14% from year-end 1973 and up 25% from a year ago, the company said.

Levels of business in EMM memory products – core, disk packs and disk drives – continue strong even though there is some indication of inventory realignment occurring within the industries served by EMM, the company said.

The company reduced its trade payables by $2.3 million and increased its cash balance by $2 million during the half year.

IBM Settlement Ups 1st Quarter Ampex Earnings

REDWOOD CITY, Calif. – Aided by a $13 million settlement from IBM, Ampex Corp. profits soared in the first quarter ended July 27. The settlement with IBM signalled the end of disputes involving allegations of patent infringement and antitrust violations.

First-quarter earnings were reported at $13.1 million or $1.21 a share, up from $872,000 or 8 cents a share in the year-ago period.

Before Tax Gains

Before the extraordinary gains from tax-loss carryforwards of $5.5 million, first-quarter earnings were $7.6 million or 70 cents a share, compared with $594,000 or 5 cents a share a year ago.

Revenues, excluding the IBM settlement, were $64.5 million in the quarter, up from $62 million a year ago.

After the IBM settlement, total revenue was reported at $78.5 million, compared with $63.2 million in the 1973 quarter.

Richard J. Elkus, Ampex chairman, said at the annual meeting that fiscal 1975 earnings excluding the IBM settlement will exceed the $5.4 million in earnings of fiscal 1974.

Earnings Rise 60% In Tymshare Quarter

CUPERTINO, Calif. — Tymshare, Inc.'s second-quarter earnings rose 60% on a 36% gain in revenues for the period ended June 20.

Earnings reached $642,707 or 21 cents a share, compared with $400,358 or 13 cents a share in the year-ago period.

Revenues grew to $7.9 million from $5.8 million.

Six Months

In the six months, earnings and revenues also grew, with earnings climbing to $1.2 million or 40 cents a share from $907,691 or 30 cents a share in the year-ago period.

Revenues were $15.1 million compared with $11.2 million last year.

REI Avoids $1.6 Million Loss By Refinancing Convertible Notes

DALLAS – Recognition Equipment, Inc. (REI) avoided posting a loss for the nine months ended July 31 with a restructuring of its 7-1/2% convertible subordinated notes.

The refinancing showed up on the books as a $1,999,000 gain, resulting in income before extraordinary items of $414,000.

Earnings after extraordinary items, including estimated income tax benefits worth $949,000 from operating loss carryforwards, were $1,363,000.

Without the boost from its debt restructuring, REI would have shown a loss before extraordinary items of $1,585,000 and a net loss of $636,000 for the nine months, the company said.

The manufacturer of document readers reported revenues of $28,623,000 during the period, suffering a loss of $1,494,000 during the first quarter, according to the firm's president.

Since then the company has been operating on close to a break-even basis, he said.

In the three months ended July 31, income rose to $2,084,000 or 40 cents a share, compared with $1,793,000 or 35 cents a share in the same period a year ago.

The company reported a backlog of $22,419,000 in orders as of July 31. Slightly over half the orders are for equipment purchases rather than leases.

The backlog shows a decrease of $4 million over last year, although revenues for the nine months increased slightly.

Expansions

Interdata, Inc. has opened a sales and service office in Atlanta at 1925 Centry Blvd.

Cyphernetics Corp. has opened a district office at 1211 Connecticut Ave., N.W., Washington, D.C.

Data 100 Corp. has completed construction of a 100,000 sq-ft manufacturing plant in Minneapolis, replacing a 40,000 sq-ft plant in Edina, Minn.

Datapoint Corp. recently opened a sales office in Honolulu at 745 Fort St.

General Automation, Inc. has purchased its existing corporate headquarters complex in Anaheim, Calif., as well as an adjacent building, providing the company with 300,000 sq ft of manufacturing and administrative space.

Incoterm Corp. has opened sales offices in Columbus, Ohio and Denver.

Centronics Data Computer Corp. has opened seven service centers in Texas, Louisiana, Oklahoma and New Mexico.

Data Transmission Co. (Datran) has opened a sales office in St. Louis, Mo.

Qantel Corp. is moving to larger facilities at 3525 Breakwater Ave., Hayward, Calif. The move will increase manufacturing space from 24,000 to 38,000 sq ft.

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Earnings Reports

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Year Ended May 31

	1974	1973
Shr Ernd	$1.04	$1.06
Revenue	26,712,000	22,099,000
Earnings	867,000	889,000

VICTOR COMPTOMETER
Three Months Ended June 30

	1974	1973
Shr Ernd	$.22	$.16
Revenue	65,472,610	50,505,498
Earnings	1,287,739	941,004
6 Mo Shr	.39	.32
Revenue	118,635,510	101,054,158
Earnings	2,276,472	1,884,214

GOULD
Year Ended June 30

	1974	1973
Shr Ernd	$3.51	$2.83
Revenue	739,747,000	619,458,000
Earnings	30,439,000	23,862,000
3 Mo Shr	.96	.78
Revenue	190,506,000	178,409,000
Earnings	8,523,000	6,622,000

ELECTRONIC DATA SYSTEMS
Year Ended June 30

	1974	1973
Shr Ernd	$1.28	$1.27
Revenue	118,734,000	111,882,000
Earnings	15,349,000	15,200,000

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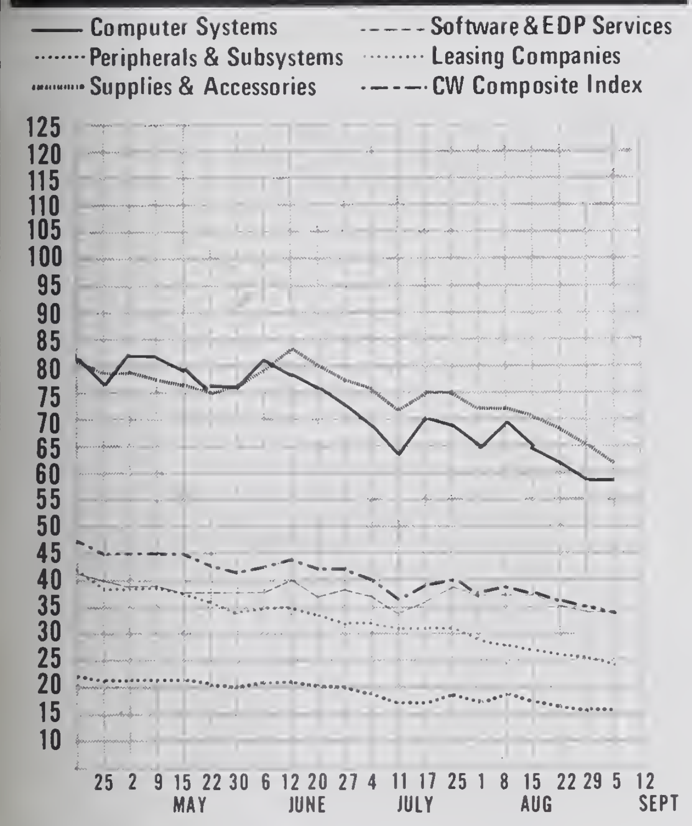

INFORMATION MAGNETICS
Six Months Ended June 29

	1974	1973
Shr Ernd	$.28	$.23
Revenue	11,261,025	7,960,815
Earnings	354,747	291,110

INFOREX
Three Months Ended June 28

	1974	1973
Shr Ernd	$.01	$.33
Revenue	11,706,000	9,102,000
Tax Cred	.....	368,000
Earnings	30,000	905,000
6 Mo Shr	.....	.63
Revenue	22,504,000	16,855,000
Tax Cred	.....	707,000
Earnings	(62,000)	1,718,000

IBM
Three Months Ended June 30

	1974 (000)	1973 (000)
Shr Ernd	$3.28	a$2.44
Revenue	3,260,038	2,546,665
Earnings	482,564	356,718
6 Mo Shr	6.22	a4.78
Revenue	6,261,778	4,997,176
Earnings	913,827	696,850

a-Adjusted for a 25% stock dividend in May 1973.

LEAR SIEGLER
Year Ended June 30

	1974	1973
Shr Ernd	$1.17	$.91
Revenue	658,091,000	615,576,000
Earnings	1,933,000	17,033,000
3 Mo Shr	.43	.35
Revenue	170,421,000	172,266,000
Earnings	6,549,000	5,858,000

APPLIED MAGNETICS
Three Months Ended June 30

	a1974	1973
Shr Ernd	....	$.19
Revenue	$15,042,000	13,979,000
Earnings	(1,005,000)	792,000
9 Mo Shr	.....	.43
Revenue	43,570,000	35,851,000
Earnings	(381,000)	1,820,000

a-Includes operations of Trendata Corp., purchased in February 1973.

CODEX CORP.
Three Months Ended June 30

	1974	1973
Shr Ernd	$.73	$.38
Revenue	5,198,000	2,149,000
Tax Cred	68,000	257,000
Earnings	1,070,000	548,000
9 Mo Shr	2.00	.96
Revenue	12,354,000	5,222,000
Tax Cred	950,000	654,000
Earnings	2,922,000	1,377,000

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N	PIIRROUGHS CORP	76-217	79 7/8	+2 1/4	+2.8
O	COMPUTER AUTOMATION	9- 14	10 1/8	+ 3/8	+3.8
N	CONTROL DATA COPP	I6- 38	17 1/2	- 3/8	-2.0
N	OATA GENERAL CORP	16- 3P	I7 5/8	+I 5/8	+10.I
O	OATAPOINT CORP	9- 15	8 3/4	0	0.0
O	OIGITAL COMP CONTROL	2- 5	2	+ 1/4	+14.2
N	DIGITAL EQUIPMENT	77-12I	82 5/P	+3 I/8	+3.9
N	ELECTRONIC ASSOC.	2- 3	1 7/P	- 1/8	-6.2
A	ELECTPONIC ENGINFER.	5- 11	5 5/8	+ I/4	+4.6
N	FOXPORO	22- 48	24	+1 I/2	+6.6
O	GENERAL AUTOMATION	24- 40	26 1/2	+ I/4	+0.9
O	GPI COMPUTER COPP	1- 2	1/2	0	0.0
N	HEWLETT-PACKARO CO	66- 90	69 1/2	+ 1/2	+0.7
N	HONEYWELL INC	34- 86	35 5/8	+1 5/8	+4.7
N	IRM	180-25I	182 1/4	-6 1/2	-3.4
O	INTEROATA INC	P- 22	19	0	0.0
O	MICROOATA CORP	3- 5	3 1/8	- 1/4	-7.4
N	NCR	25- 40	25 3/4	+ 1/8	+0.4
N	PAYTHFON CO	27- 39	27 3/4	+ 1/8	+0.4
N	SINGER CO	20- 40	I9 7/8	-I 1/4	-5.9
N	SPFRRY RANO	2P- 44	29 3/P	+ 7/8	+3.0
A	SYSTEMS ENG. LARS	I- 3	1 1/2	- 1/4	-14.2
N	TFXAS INSTRUMENTS	73-115	76 I/8	-2 7/8	-3.6
O	ULTIMACC SYSTEMS INC	1- 2	1 1/2	0	0.0
N	VARIAN ASSOCIATES	7- 13	7 5/8	+ 5/8	+8.9
N	WANG LABS.	I0- 20	9 3/4	- 1/4	-2.5
N	XFPOX CORP	77-I27	P2 1/4	+ 3/4	+0.9

LEASING COMPANIES

EXCH		PRICE 1974 PANGE (1)	CLOSE SEP 5 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	PPESNAHAN COMP.	2- 2	2 1/8	0	0.0
O	COMOISCO INC	1- 7	1	- 5/8	-38.4
A	COMMERCE GROUP CORP	3- 6	2 7/P	+ 1/8	+4.5
O	COMPUTER EXCHANGF	1- I	1/8	0	0.0
A	COMPUTER INVSTRS GPP	I- 4	7/8	- I/8	-12.5
O	COMP. INSTALLATIONS	1- 1	1/4	0	0.0
M	OATRONIC RENTAL	1- 1	3/4	0	0.0
A	OCL INC	0- I	3/8	0	0.0
N	OPF INC	2- 5	2 5/8	+ I/8	+5.0
O	EOP RESOURCES	2- 3	3 1/4	0	0.0
A	GRANITE MGT	1- 3	1 1/8	- 1/8	-10.0
A	GPEYHOUNO COMPUTER	3- 6	2 3/4	- I/8	-4.3
A	ITEL	3- 6	3 1/4	- I/4	-7.1
N	LEASCO CORP	5- 12	8 3/8	- 3/8	-4.2
O	LEASPAC CORP	1- 2	5/8	0	0.0
O	LECTRO MGT INC	1- 1	I/P	0	0.0
O	NPG INC	2- 5	1 3/4	- 1/4	-12.5
A	PIONEER TEX COPP	2- 10	2 1/4	+ 1/8	+5.8
A	POCKWOOO COMPUTER	1- I	5/8	0	0.0
N	U.S. LEASING	5- 24	6 1/2	+ 1/4	+4.0

EXCH: N=NEW YOPK; A=AMEPICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIOWEST; O=OVEP-THE-COUNTER
O-T-C PRICES ARE BIO PPICES AS OF 3 P.M. OR LAST BIO
(1) TO NEAREST DOLLAR

SOFTWARE & EOP SERVICES

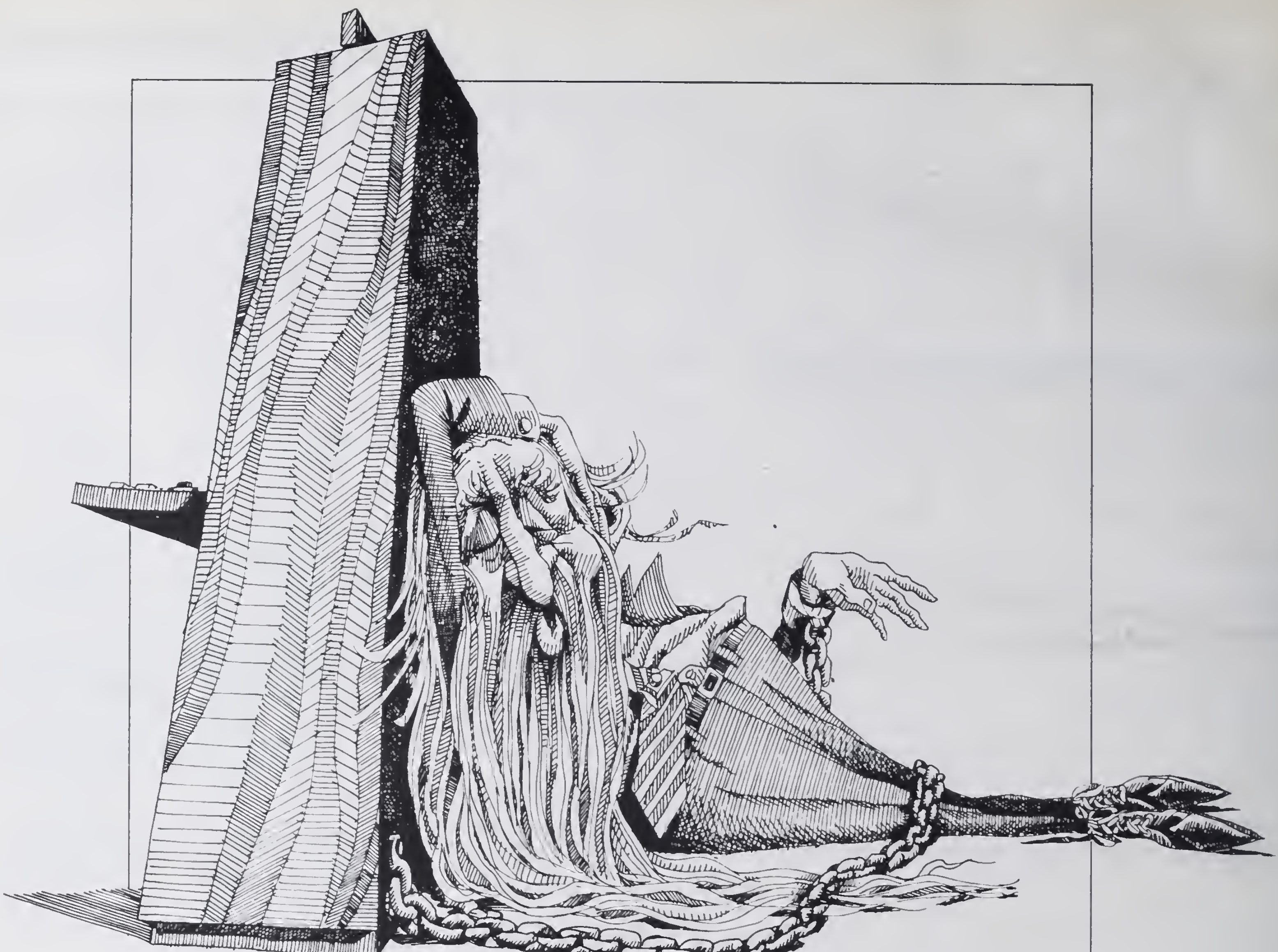
EXCH		PPICE 1974 RANGE (1)	CLOSE SEP 5 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCEO COMP TECH	1- 2	3/4	0	0.0
A	APPLIFO OATA PES.	2- 3	1 3/4	+ 1/8	+7.6
O	APPLIFO LOGIC	1- I	1/8	0	0.0
N	AUTOMATIC OATA PPOC	2I- 57	22 3/4	+1	+4.5
O	BPANOON APPLIED SYST	1- 1	3/8	+ 1/8	+50.0
O	CENTRAL OATA SYSTEMS	4- 6	4 1/4	0	0.0
O	COMPUTER OIMENSIONS	2- 3.	1 1/2	0	0.0
O	COMPUTER HORIZONS	1- 5	1 1/4	0	0.0
O	COMPUTER NETWORK	1- 2	1 I/4	0	0.0
N	COMPUTER SCIENCES	2- 4	2	- 1/8	-5.8
O	COMPUTER TASK GROUP	1- I	1/2	- 1/4	-33.3
O	COMPUTER TECHNOLOGY	1- I	1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 1/4	0	0.0
O	COMRESS	1- 1	1/4	- 1/8	-33.3
O	COMSHARE	2- 4	1 7/8	- I/8	-6.2
N	COROUPA CORP	2- 4	1 7/8	- 1/8	-6.2
O	OATATAB	1- 3	1 1/4	- 1/4	-I6.6
A	ELECT COMP PPOG	I- 1	I/P	0	0.0
N	ELECTRONIC OATA SYS.	12- 25	13 3/4	-1 1/8	-7.5
O	INFONATIONAL INC	I- 2	I/2	0	0.0
O	I.O.A. OATA COPP	1- 1	1/4	0	0.0
O	IPS COMPUTER MAPKET.	1- 1	7/8	+ 1/8	+16.6
O	KEANE ASSOCIATES	2- 4	1 3/4	0	0.0
O	KEYOATA COPP	1- 6	1 3/4	+ 3/8	+27.2
O	LOGICON	2- 5	3	- 1/P	-4.0
A	MANAGEMENT OATA	1- 2	1 I/8	0	0.0
O	NATIONAL CSS INC	10- 37	15	+1	+7.1
O	NATIONAL COMPUTER CO	1- I	1/4	0	0.0
A	ON LINE SYSTEMS INC	21- 30	20 7/8	+ I/4	+1.2
N	PLANNING RESEAPCH	2- 3	2 3/8	+ 1/4	+11.7
O	PROGRAMMING & SYS	1- 1	3/4	+ 1/8	+20.0
O	RAPIOATA INC	1- 5	1 3/8	0	0.0
O	SCIENTIFIC COMPUTEPS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1/2	0	0.0
O	TCC INC	1- 1	1/2	0	0.0
O	TYMSHAPE INC	7- 12	7 3/4	- 1/8	-I.5
O	UNITED OATA CENTEP	2- 4	2 1/2	- I/4	-9.0
A	URS SYSTEMS	2- 4	1 3/4	- I/8	-6.6
N	WYLY CORP	2- 5	2 1/P	+ I/8	+6.2

PERIPHERALS & SUPSYSTEMS

EXCH		PRICE 1974 RANGE (1)	CLOSE SEP 5 1974	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOORESSOGRAPH-MULT	5- 11	4 7/8	+ 1/4	+5.4
O	AOVANCEO MEMOPY SYS	1- 7	1 I/2	- 1/4	-14.2
N	AMPEX COPP	3- 5	3 I/4	- 1/8	-3.7
O	ANOEPSON JACOBSON	2- 4	2	- I/4	-1I.1
O	BFEHIVE MEOICAL ELEC	2- 7	2 1/4	+ 1/2	+28.5
A	BOLT,PERANEK & NEW	5- 9	6	- 3/4	-1I.1
N	BUNKEP-RAMO	5- P	4 5/P	- 1/8	-2.6
A	CALCOMP	6- 11	6 5/P	+ 1/8	+1.9
O	CAMBPIOGE MEMOPIES	6- 16	5 5/8	-1 1/2	-21.0
O	CENTRONICS OATA COMP.	11- 23	12 1/4	0	0.0
O	COOEX CORP	8- 15	10 1/4	+ 1/4	+2.5
O	COGNITRONICS	1- 2	3/8	- 1/4	-40.0
O	COMPUTER COMMUN.	1- 2	5/8	- I/8	-16.6
A	COMPUTER EQUIPMENT	1- 2	I 1/2	+ I/4	+20.0
O	COMPUTER MACHINERY	2- 5	2 3/8	- 1/8	-5.0
O	COMPUTER TRANSCEIVER	1- 2	7/8	0	0.0
N	CONPAC CORP	I2- 22	II 5/8	- I/2	-4.1
O	OATA ACCESS SYSTEMS	2- 3	2 1/2	0	0.0
O	OATA 100	7- 13	6 7/8	- 1/8	-1.7
A	DATA PROOUCTS CORP	3- 4	3	- I/8	-4.0
O	OATA PECOGNITION	1- 1	1/4	0	0.0
O	DATA TECHNOLOGY	2- 4	2 5/8	0	0.0
O	OECISION OATA COMPUT	4- I3	4 3/8	-1	-I8.6
O	OFLTA OATA SYSTEMS	1- 2	3/4	+ 1/8	+20.0
O	OI/AN CONTROLS	1- 2	5/P	0	0.0
N	ELECTPONIC M & M	2- 4	I 7/8	+ 1/P	+7.1
O	FABRI-TEK	1- 3	I 3/8	0	0.0
O	GENEPAL COMPUTEP SYS	2- 4	1 3/4	0	0.0
N	GENEPAL ELECTPIC	35- 65	36 5/P	0	0.0
N	HAZELTINE COPP	3- 7	3 1/8	- 3/8	-10.7
O	INFOREX INC	2- 5	3	0	0.0
O	INFORMATION OISPLAYS	1- 1	1/8	0	0.0
O	INFORMATION INTL INC	8- 14	8 1/2	+ 1/4	+3.0
A	LUNOY ELECTRONICS	3- 3	2 7/P	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/8	0	0.0
N	MEMOPEX	2- 5	2 3/4	- 5/8	-18.5
A	MILGO ELECTRONICS	8- 18	8 I/4	+ I/8	+1.5
N	MOHAWK OATA SCI	2- 4	1 5/8	0	0.0
O	OOEC COMPUTEP SYST.	1- 3	1	- 1/2	-33.3
O	OPTICAL SCANNING	3- 6	3 1/2	0	0.0
O	PERTEC COPP	2- 6	2 1/8	- 1/4	-10.5
A	POTTEP INSTRUMENT	2- 5	2	+ 1/8	+6.6
O	PPECISION INST.	1- 3	3/4	0	0.0
O	QUANTOR CORP	2- 8	2 1/2	0	0.0
O	RECOGNITION EQUIP	2- 5	2 3/8	- I/8	-5.0
N	SANOEPS ASSOCIATES	3- 8	2 5/8	- I/8	-4.5
O	SCAN DATA	1- 2	1 I/8	+ 1/8	+12.5
O	STOPAGE TECHNOLOGY	P- 15	8 1/4	- 5/8	-7.0
O	SYCOP INC	6- 13	6 1/4	+ 1/4	+4.I
O	TALLY COPP.	2- 4	2 1/4	+ 1/8	+5.8
O	TEC INC	3- 7	2 3/4	0	0.0
N	TEKTPONIX INC	24- 48	24	- 3/8	-1.5
N	TELEX	3- 4	2 3/4	0	0.0
O	WANGCO INC	6- I3	6 1/4	0	0.0
O	WILTEK INC	3- 8	2 3/4	- 1/4	-8.3

SUPPLIES & ACCESSOPIES

EXCH		PRICE 1974 RANGE (1)	CLOSE SEP 5 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	BALTIMORE BUS FOPMS	4- 6	4 I/2	- 1/2	-10.0
A	BARRY WRIGHT	4- 7	4 I/8	+ 1/8	+3.1
O	CYPERMATICS INC	1- 2	7/8	- 1/8	-12.5
A	OATA OOCUMENTS	23- 54	35 5/8	- 1/2	-1.3
O	DUPLEX PROOUCTS INC	6- 17	15 I/4	- 1/4	-I.6
N	ENNIS BUS. FORMS	5- 7	4 7/8	- 3/8	-7.1
O	GPAHAM MAGNETICS	6- 11	6 1/2	+ 1/4	+4.0
O	GRAPHIC CONTROLS	7- 11	7 I/4	-1	-12.1
N	3M COMPANY	55- 79	58 1/2	+ I/4	+0.4
O	MOORE COPP LTD	40- 57	4I 1/4	+1	+2.4
N	NASHUA CORP	24- 45	25	-1	-3.8
O	PEYNOLDS & PEYNOLO	9- 35	10	+ 1/2	+5.2
O	STANOARO REGISTER	1I- 16	11	- 1/4	-2.2
O	TAB PROOUCTS CO	5- I1	4 I/2	- 3/4	-14.2
N	UAPCO	16- 23	I6 7/P	-1 5/8	-8.7
A	WABASH MAGNETICS	4- 7	4 1/P	- I/8	-2.9
N	WALLACE BUS FORMS	14- 24	17 1/2	- 1/2	-2.7



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